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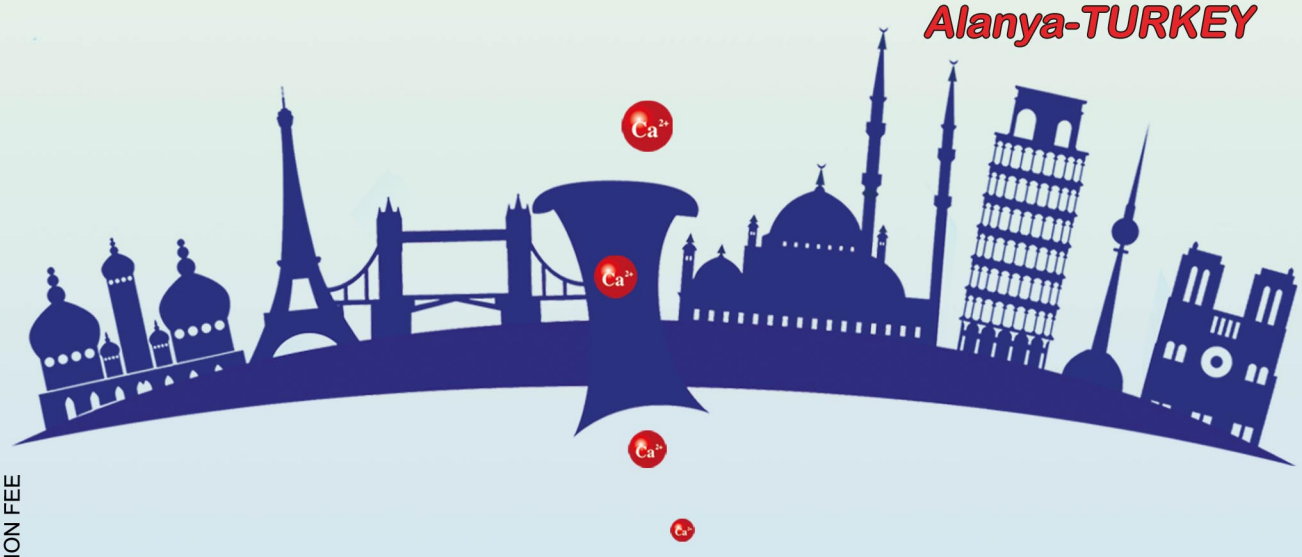

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AIM AND SCOPES
Journal of Cellular Neuroscience and Oxidative Stress is an online journal that publishes original research articles, reviews and short reviews on the molecular basis of biophysical, physiological and pharmacological processes that regulate cellular function, and the control or alteration of these processes by the action of receptors, neurotransmitters, second messengers, cation, anions, drugs or disease.

Areas of particular interest are four topics. They are;

A- Ion Channels (Na^+- K^+ Channels, Cl^- channels, Ca^{2+} channels, ADP-Ribose and metabolism of NAD^+, Patch-Clamp applications)

B- Oxidative Stress (Antioxidant vitamins, antioxidant enzymes, metabolism of nitric oxide, oxidative stress, biophysics, biochemistry and physiology of free oxygen radicals)

C- Interaction Between Oxidative Stress and Ion Channels in Neuroscience
(Effects of the oxidative stress on the activation of the voltage sensitive cation channels, effect of ADP-Ribose and NAD^+ on activation of the cation channels which are sensitive to voltage, effect of the oxidative stress on activation of the TRP channels in neurodegenerative diseases such Parkinson's and Alzheimer's diseases)

D- Gene and Oxidative Stress
(Gene abnormalities. Interaction between gene and free radicals. Gene anomalies and iron. Role of radiation and cancer on gene polymorphism)

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Ion channels, cell biochemistry, biophysics, calcium signaling, cellular function, cellular physiology, metabolism, apoptosis, lipid peroxidation, nitric oxide, ageing, antioxidants, neuropathy, traumatic brain injury, pain, spinal cord injury, Alzheimer's Disease, Parkinson's Disease.

7th World Congress of Oxidative Stress, Calcium Signaling and TRP Channels

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Poster Presentations

Poster Presentations

Poster No. 1

Low molecular weight heparin treatment reduces apoptosis, oxidative stress and calcium signaling in patients with recurrent pregnancy loss: Involvement of TRPM2 and TRPV1 channels

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Recurrent pregnancy loss (RPL) is known to be associated with increased thrombophilia and oxidative stress (de Jong et al. 2015), however, the mechanism of thrombocyte activation is still unclear. In addition, low molecular weight heparin (LMWH) has regulator role on Ca^{2+} concentration in several diseases (Goodale et al. 2017). Ca^{2+} overload should elicit a series of cell injury events, including DNA damage, apoptosis, and accumulation of radical oxygen species (ROS). TRPM2 and TRPV1 channels are activated by different stimuli including ROS (Carrasco et al. 2018). We have hypothesized that the Ca^{2+} regulator properties of LMWH may affect intracellular Ca^{2+} concentration through modulation of TRPM2 and TRPV1 in thrombocytes of patients with RPL. The objective of this study was to investigate the effects of infliximab on calcium signaling, oxidative stress and apoptosis in thrombocytes of RPL patients.

Thrombocytes collected from ten patients with RPL and ten healthy controls were used in the study. Intracellular free Ca^{2+} concentration, ROS, mitochondrial membrane depolarization (JC1), apoptosis, caspase 3 and caspase 9 values were high in the thrombocytes of RPL patients and they were reduced by the LMWH treatment. However, the cell viability level was increased in the thrombocytes of RPL patients by the LMWH treatment. The hydrogen peroxide and capsaicin-induced increase of intracellular Ca^{2+} were further decreased by the TRPM2 (N-(p-amylcinnamoyl)anthranilic acid) and TRPV1 (capsazepine) channel blocker incubations, respectively.

In conclusion, the current study suggests that LMWH is useful against apoptotic cell death and oxidative stress in thrombocytes of RPL patients, which seem to be dependent on increased levels of intracellular Ca^{2+} through activation of TRPM2 and TRPV1.

Keywords: Recurrent pregnancy loss; Low molecular weight heparin; Apoptosis; Calcium signaling; Oxidative stress; Thrombocytes.

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Poster No. 2

Vitamin E and its significance for human health

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Vitamin E, also known as tocopherol, is a light-sensitive vitamin that is soluble in fat, sensitive to heat and alkali environment. E vitamin is found in nutrients, vegetable oils, avocados, spinach, nuts (almonds,

walnuts, hazelnuts), sunflower seeds, wheat seeds, peanuts, whole grains. According to the National Institute of Health (NIH), the US Recommended Daily Allowance (RDA) is 15 mg (or 22.4 IU) for adults over 14; RDA for pregnant women of any age is 15 mg (or 22.4 IU), and for women of all ages is 19 mg (or 28.4 IU). Sufficient vitamin E intake is particularly critical for babies, elderly and pregnant women.

Significant benefits of Vitamin E: Cholesterol balance neutralize free radicals and prevent the onset of diseases. It heals and rejuvenates the skin, strengthens the hair, adjusts the hormone balance, and regulates the menstrual cycle. It improves eyesight, helps protect against Alzheimer's disease, can reduce the risk of cancer and improve the effectiveness of medical treatments. It increases physical and muscle strength. It plays a significant role in growth and development in pregnancy.

Vitamin E is a fat-soluble vitamin and can be stored in the body. Since it is an antioxidant vitamin, neutralizing free radicals in the body, daily consumption in adequate amounts is recommended.

Keywords: Vitamin E, nutrients that contain vitamin E, significance in human health.

Poster No. 3

Effects of UV-C exposure on apoptosis, mitochondrial depolarization and ROS production in ARPE-19 eye cells

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Recent studies have suggested that ultraviolet-C (UV-C) overexposure induces the overproduction of reactive oxygen species (ROS) in body cells and the ROS is one of the main causes of apoptosis. Potential harmful effect of UV-C irradiation is still being discussed; Transient receptor potential vanilloid 1 (TRPV1) channel is one of crucial membrane sensors that are permeable to positively charged ions and non-selective cation channels expressed in ARPE19 cell lines. TRPV1 channels have distinct activation machineries including capsaicin (CAP), environmental toxicants (i.e. ROS) and physical factors (i.e. acidic pH and heat). Non-specific TRPV1 channel antagonist is capsazepine (CPZ). There is limited report on calcium ion (Ca^{2+}) influx, apoptosis and oxidative stress through TRPV1 activation in the cells by UV-C exposure.

It is well known that eye is one of the organs most susceptible to sunlight-induced damage. In this study we aimed to investigate the effects of UV-C exposure (100 J/m^2) on ARPE19 cells via TRPV1 mediated, apoptosis, cell viability, ROS production, loss of mitochondrial membrane potential and cysteine dependent aspartate protease (caspase) 3 and 9 enzyme activities. The cells were randomly divided into four groups as control, UV-C, UV-C+CAP and UV-C+CPZ.

Apoptosis level in UV-C+CAP group was significantly higher than control, UV-C, and UV-C+CPZ group. In addition, it was lowest in UV-C+CPZ group comparing to all other groups. Similarly, caspase 3 and 9 enzyme activities were highest in UV-C+CAP and lowest in UV-C+ CPZ group comparing to control and UV-C groups. Mitochondrial membrane depolarization level was also found very high in UV-C+CAP group comparing with other groups. Our results showed that ROS production level in UV-C+CPZ group was significantly decreased by CPZ.

In this study we observed novel effects of CPZ on cellular viability in ARPE-19 cells. It is also respect to originality of our work that TRPV1 antagonist can be useful for the inhibition of destructive effects of irregular ROS production and mitochondria related apoptotic pathways in UV-C exposure.

Keywords: UV-C irradiation, reactive oxygen species, apoptosis, ARPE-19 cells, TRPV1, capsazapine.

Poster No. 4

Protective role of N-acetyl cysteine on chemical hypoxia-induced cell death and oxidative stress in human cardiac myocytes

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Oxygen (O_2) consumption is one of the most important cellular metabolic processes in cardiac functions that provides energy necessity of the cells under normoxic conditions which maintain the range between hypoxia and hyperoxia. Two major cause of reactive oxygen species (ROS) overproduction are high amount of O_2 consumption and hypoxia that promote cellular oxidant status and finally apoptosis. As a potent glutathione supplier N-acetyl cysteine (Nac) has strong antioxidant properties and contributes to reduction of harmful effects of oxidative stress. Human cardiac myocytes primary cell line is widely used as in vitro model of heart diseases. Cobalt chloride ($CoCl_2$) is a chemical agent that used to induce in vitro hypoxic conditions. However, we have less data about the feeding of GSH cycle how protects cell viability of cardiac myocytes against to oxidative stress induced apoptosis. Hence, we aimed to investigate effects of Nac treatment on cell viability, ROS production, mitochondrial membrane potential (JC1), caspase 3 caspase 9 and oxidant/antioxidant parameters. The cells were divided into four different groups named as Control, Nac, hypoxia, hypoxia + Nac. We found that 1 mM Nac incubation protects cellular viability against hypoxia induced cell death. JC1, ROS, caspase 3 and 9 levels were higher in the hypoxia group as compared to the control and Nac groups and their levels were increased by the Nac treatment. Nac also supported cellular antioxidant defense system in the hypoxia-induced cells by inhibiting the ROS production and supporting glutathione antioxidant system. In conclusion, we observed novel effects of Nac regulation of cellular viability in cardiac myocytes. Hence, Nac treatments can be useful for the inhibition of destructive effects of irregular ROS production and mitochondria related apoptotic pathways in chemical ischemia.

Keywords: Apoptosis; Cardiac myocytes; Hypoxia; N-acetyl cysteine; Oxidative stress.

Poster No. 5

Bioinformatics investigation of the presence of Ca^{2+} channels of Acanthamoeba castellanii

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The free-living amoeba (FLA) belonging to the genus Acanthamoeba is the most widespread protozoan in the environment, found from natural and man-made environments. Acanthamoeba is an opportunistic protist, capable of causing granulomatous amebic encephalitis (GAE), a fatal disease central nervous system (CNS) and Acanthamoeba keratitis (AK), a painful, progressive and sight-threatening infection. A single drug which can eliminate both trophozoite and cystic forms of the parasite at the same time is currently not available. Bioinformatics research has been aimed to reveal the presence of new therapeutic targets and pathways in the treatment of Acanthamoeba.

Calcium (Ca^{2+}) channels regulate many important functions within cells. Ca^{2+} influx mediates regulation of physiological signalling pathways in parasites. Calcium channels in Acanthamoeba allow the intracellular Ca^{2+} stores to be refilled following intracellular Ca^{2+} release. It is also well known that the role of calcium in activation of some anti-parasitic drugs is very important. The search for protein sequence homology between two

pore calcium channel protein 1 (TPC-1), TPC-2, calmodulin and transient receptor potential mucolipin 1(TRPML1) was done by searching the Acanthamoeba Neff strain protein databases at NCBI and amoebadb.org by using BLASTp search. BLASTp alignment option was selected to show similarities between the proteins of both the species.

In conclusion, it may be an option for a narrow treatment approach for GAE caused by Acanthamoeba spp. therefore, the discovery of calcium channels (TPC-1, TPC-2, Calmodulin and TRPML1) on Acanthamoeba could prove to be a potential therapeutic target in the future.

Keywords: Bioinformatics tools, Acanthamoeba castellanii, Ca^{2+} channels, new therapeutic targets

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Poster No. 6

Investigation of the mitochondrial biogenesis pathways in premature ovarian failure rat models

Bilgi ERBAY[1], Ebru ÖNALAN[1], İlay BURAN[1], Ahmet TEKTEMUR[1], Tuncay KULOĞLU[2], Seda SEFEROĞULLARI[1], Deniz EROL[3], İbrahim ÖZERCAN[3]

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Premature ovarian failure (POF) is defined as the presence of inadequate ovarian function before the age of 40 years. Reactive oxygen species (ROS) and mitochondrial biogenesis play an important role in this process. The aim of the project was to determine the role of AP39 in the prevention of adverse effects of cisplatin, stress and the role of mitochondrial biogenesis pathways in the development of POY.

Sixty female Sprague Dawley rats were divided into control, AP39, cisplatin, cisplatin + AP39, stress and stress + AP39 groups that with 10 animals in each group. POF was formed with 1,5 mg / kg cisplatin or immobilization stress. Moris water maze was performed to detect the spatial learning and memory. Hormone levels, height, weight, overweight, estrus cycling follow, ROS, mitochondrial biogenesis gene expression levels were determined by different laboratuary methods.

It were detected the significant decreases in height, weight, overweight and serum E2 levels and the significant increase in serum FSH and LH values in cisplatin and stress groups according to control. Mitochondrial biogenesis, over-related genes, spatial learning and memory were found to be significantly altered in both cisplatin and stress groups compared to controls, but AP39 was not normalizing all parameters in cisplatin+AP39 and stress+AP39 groups than cisplatin and stress groups.

It has been shown that both cisplatin and stress were cause POF by using similarly molecular pathways, deteriate the learning process and disrupt the normal mitochondrial biogenesis and folliculogenesis processes in over, but not the healing effect of AP39.

Key words: Premature Overian Failure, Mitochondrial Biogenesis, Stress, Cisplatin, AP39

Poster No. 7

The effect of acupuncture on oxidative stress in health personnel

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Oxidative damage is an important mediator in the chronic psychological stress process that increases biological aging (Aschbacher et al. 2013). Acupuncture regulates multiple molecules and signaling pathways causing oxidative stress and inflammation (Zhu et al. 2017). The aim of this study was to investigate the effect of acupuncture on oxidative stress in chronic stressed health personnel. Thus, TAS (total antioxidant status), TOS (total oxidant status), OSI (oxidative stress index), TBARS (thiobarbituric acid reactive substances) and uric acid parameters were explored in unstimulated saliva samples of health personnel.

Thirteen health personnel (6F/7M, age range 19-47 years) with no systemic disease and no smoking/alcohol use were included in the study. The participants were treated for 25 minutes using the immunomodulator points, M-HN-3 (YIntang), P-6 (Neiguan), LI-4 (Hegu), ST-36 (Zusanli) and SP-4 (Gongsun) acupuncture points. Before and after acupuncture treatment, saliva samples were taken from participants. Commercial kits were used to assess oxidative stress.

After acupuncture treatment, salivary TAS levels and salivary uric acid levels were significantly increased (p values were found as 0.043 and 0.029, respectively). Although, salivary TOS levels were significantly decreased ($p = 0.452$), salivary TBARS levels decreased after acupuncture, but this result was no statistically significant ($p = 0.452$).

Consequently, acupuncture has been shown to contribute to antioxidant defense in chronic stressed health personnel. This study was performed as a preliminary study and is planned to be expanded using a wider sampling.

Keywords: Oxidative stress; Acupuncture; Health personnel

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Poster No. 8

Alpha lipoic acid attenuates apoptosis and oxidative stress in the dorsal root ganglion of diabetes-induced rats

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Neuropathic pain can arise from a wide variety injury to peripheral, including diabetes, and is characterized by spontaneous pain, hyperalgesia and allodynia which can persist long after the initial injury is resolved. Oxidative stress has been linked to cell death and neuropathic pain (Kahya et al. 2017). Alpha lipoic acid (ALA) has been considered a potent antioxidant that detoxifies a variety of reactive oxygen species in diabetes. As a sulfur containing substance, ALA is containing sulfur groups and it is a member of thiol cycles. A results of recent study indicated involvement of oxidized-thiol groups on activation of several channels such as TRPA1 and TRPV1 in neurons (Ogawa et al. 2016). In order to better characterize the actions of ALA in the peripheral pain, we tested the effects of ALA on apoptosis and oxidative stress and in the DRG neuron of streptozotocin (STZ)-induced

diabetic rats.

Wistar Albino rats were randomly divided into four groups. First group was used as control. Second group used as diabetic. Third and fourth groups received ALA and STZ+ALA, respectively. Diabetes was induced using a single dose of intraperitoneal STZ. On 14th day of DRG samples were freshly taken from all animals. In confocal microscope analyses, we observed modulator role of ALA on apoptosis (Annexin V and propidium iodide), caspase 3, caspase 9, mitochondrial depolarization and cytosolic ROS production values in the DRG neurons.

In conclusion, in our diabetes experimental model, oxidative stress are involved in the Ca^{2+} entry-induced neuronal death, and modulation of this channel activity by ALA pretreatment may account for their neuroprotective activity against apoptosis.

Keywords: Apoptosis; Oxidative stress; Alpha lipoic acid; Diabetes.

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Poster No. 9

Transient Receptor Potential (TRP) channel regulation of smooth muscle contraction in asthma

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The role of TRP channels in Human Airway Smooth Muscle (HASM) cells is poorly defined and the Ca^{2+} influx pathways that regulate smooth muscle contraction in asthma remain elusive. To investigate Ca^{2+} carrying TRP channel expression and their functional roles in HASM cells from asthmatic patients compared to healthy subjects.

QRT-PCR identified expression of Ca^{2+} carrying TRP channels in HASM. Ratiometric Ca2+ measurements (Fura-2AM/Flexstation scanning Fluorometer) and collagen gel contractions assays used in conjunction with TRPA1-specific pharmacological tools (Ally isothiocyanate/A-967079) have been used to identify the functional role of TRPA1 in HASM.

In cultured HASM cells a profile of Ca^{2+} carrying TRP channels present significant TRPA1 expression in asthmatic patients compared to healthy controls ($p<0.02$). Selective TRPA1 agonists induce fast and sustained $[Ca^{2+}]i$ increase compared to controls ($p<0.01$), attenuated by the use of specific TRPA1 antagonists. Targeting TRPA1 pharmacologically induces a functional response in gel contraction assays, with dose-dependent relaxation even in the presence of strong contractile agonists such as Bradykinin.

In conclusion, these data show that cultured HASM cells express functional TRPA1 ion channels, suggesting a role in the regulation of agonist induced airway smooth muscle contraction/relaxation.

Keywords: TRP channels; Asthma; Smooth muscle contraction.

Poster No. 10

Ca^{2+} channel blockers kill neuroblastoma but effectively protect neuron cells

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In present study we evaluate Ca^{2+} channel blockers effects on induced glutamate toxicity in cortex neurons and neuroblastoma cells model. For this aim we used MTT assay, TAS (Total antioxidant status), TOS (Total oxidant status) and annexin-V (flowcytom study apoptosis marker).

We obtained cortex neurons and neuroblastoma cells form Department of Medical Pharmacology, Ataturk University (Erzurum, Turkey). When neurons reach enough branches and neuroblastoma cells reach %90 confluence glutamate 10^{-5} mM were added to wells. 10 min after exposure time different concentration of amlodipine (20, 50 and 100µM) and lacidipine (1, 2 and 4 µg) were added. The MTT, antioxidant, oxidant levels and apoptosis marker were measured. The all data were analyzed by using One Way Anova method.

Our result shows glutamate 10^{-5} mM reduced cell viability to %41 in cortex neuron. In the L type Ca^{2+} channel blockers induced dramatically have neuroprotective effect in 50 µM dose as %89 cell viability. Lacidipine induced viability ratio not as high as %82. In neuroblastoma, amlodipine has minor effect on MTT level but it has major effect on the oxidant level.

According our result indicated that L type Ca^{2+} channel blockers have maximum neuroprotective effects on the oxidant and antioxidant values. In addition, the channel blockers with 100 µM dose reduced MTT level but not up to %72. In conclusion, the L type Ca^{2+} channel blockers did not affect neuroblastoma cells and oxidant level not raised meaningfully (Alberdi et al., 2002; Erickson, 2017).

Keywords: L type Ca^{2+} blockers; Glutamate excitotoxicity; Neuroblastoma.

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Poster No. 11

Ischemia-modified albumin levels in pre-eclamptic mothers and their babies and its relation to neonatal morbidity and mortality

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Pre-eclampsia (PE) is a main cause of both maternal and fetal morbidity and mortality. It is associated with ischemia and increased oxidative stress in placenta, which may lead to modification of plasma albumin to ischemia-modified albumin (IMA). We aimed to determine the levels of IMA in pregnant women with PE and their babies, and to reveal its relation to morbidity and mortality.

The study was included 25 mild pre-eclamptic pregnant women and their babies as PE group, and 25 normal pregnant women and their babies as a control group. IMA, complete blood count (CBC), liver function tests (LFTs), renal function tests (RFTs), albumin, and C-reactive protein levels were measured in pregnant women's peripheral venous blood samples before the birth and measured in their babies' cord blood and peripheral venous blood samples at 6th and 24th hour of postnatal age.

While IMA, LFTs and RFTs values were significantly higher in pre-eclamptic pregnant women to compare with normal pregnant women. Albumin and CBC values were significantly lower in pre-eclamptic pregnants. 40% of pre-eclamptic mothers' babies were small for gestational age (SGA), and 12% of them were intrauterin growth retardation (IUGR). While cord blood IMA levels were significantly higher in pre-

eclamptic mothers' babies than the control group. Cord blood IMA levels in the babies born SGA were significantly higher than the babies born non-SGA.

In conclusion, cord blood IMA levels may be used as an indicator of fetal ischemia and/or hypoxia in the babies with SGA.

Key words: Pre-eclampsia, ischemia-modified albumin, neonate, morbidity

Poster No. 12

Relationship between serum caspase-1 levels, insulin resistance and oxidative stress in women with polycystic ovary syndrome

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Caspase-1 is implicated in several important inflammatory diseases including polycystic ovary syndrome (PCOS). Interleukin-10 (IL-10) is an anti-inflammatory cytokine and plays important role in chronic inflammatory conditions. This study was planned to determine Caspase-1 and IL-10 levels in women with PCOS.

Forty-two women with PCOS and thirty-seven healthy controls were evaluated in this controlled clinical study. Serum lipid sub-fractions, fasting glucose, insulin and other hormones (gonadotropins, androgens), IL-10, malondialdehyde (MDA), glutathione (GSH) and Caspase-1 levels were measured. Homeostasis model assessment (HOMA-IR) was used to estimate insulin resistance.

Free androgen index (FAI), HOMA-IR, MDA and Caspase-1 levels were significantly higher in subjects with PCOS. However, the women with PCOS had considerably lower GSH concentrations levels than healthy subjects. Serum IL-10 levels were higher in study subjects than in controls, although it was statistically insignificant. Caspase-1 was positively associated with IL-10.

These outcomes propose that Caspase-1 may have a pivotal role in triggering the processes leading to chronic low-grade inflammation in the pathogenesis of PCOS, independent of insulin resistance, androgen excess and oxidative stress. Nevertheless, the precise role of Caspase-1 in the pathogenesis of the disease remains to be elucidated.

Key Words: Caspase-1, IL-10, PCOS, Insulin Resistance, Oxidative Stress

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Poster No. 13

The investigation of the effect of nigella sativa oil on oxidative/nitrosative stress in the salivary gland of rats exposed to total cranial irradiation

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This study is an experimental study conducted to determine the protective effects of Nigella sativa oil NSO) in the prevention of harmful effects of free radicals generated by radiotherapy in rats. In the study, 36 male Wistar-Albino rats weighing 200 ± 20 grams were used. In the study, 2 control groups and 2 experimental groups were formed. In the study, nitric oxide ($NO^{\bullet}$), peroxynitrite ($ONOO^{-}$), malondialdehyde (MDA) levels, nitric oxide synthase (NOS) and xanthine oxidase (XO) activities were investigated in each group. The values obtained from the study were analyzed with SPSS for Windows version 22 package program. As a result of the statistical analyses it has been determined that NO, $ONOO^{-}$, MDA levels, NOS and XO activities were found to be significantly higher in ionized radiation group than all the groups. On the other hand ONOO-, MDA levels and XO activity were higher in the control group given NSO than the other groups, but the difference between the groups was not significant.

In conclusion, the findings obtained in the study suggest that the use of NSO has a protective effect against the adverse effects of oxidative/nitrosative stress caused by ionizing radiation.

Key words: Radiation, Radiotherapy, Nigella sativa, Oxidative Stress, Nitrostative Stress

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Poster No. 14

Investigation of genotoxic effect of Escherichia coli in urinary tract epithelial cells with micronucleus assay

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Urinary tract infections (UTIs) are the most common extraintestinal diseases among women in the world, and they cause diseases such as urethritis, cystitis and acute/chronic pyelonephritis. Commonly E. coli strains, found in the intestine, have symptoms of urinary tract infections when they enter the urinary tract. In the current study, we investigated the genotoxic effect of E. coli by micronucleus assay in women with urinary tract infection.

The urine samples were cultured in bloody and Eosin Methylene Blue agar. E. coli containing culture was determined as patient group. Non-infection E. coli culture was identified as a control group. A total of 80 individuals consisting of 40 E. coli infection, and 40 control female patients were monitored for DNA damage in urinary tract epithelial cells by Micronucleus assay. Recurrent UTIs are among the most common bacterial infections, especially in the women. All of the 80 urine samples were analysis with dipstick for pH, nitrites, leukocyte esterase. Leukocyte count detected with automatic urine sediment analyzer. Several rapid screening tests are used commonly to make a presumptive diagnosis of UTI, including dipstick biochemical analysis of urine for pH, nitrites, leukocyte esterase. The leukocyte esterase dipstick a widely used to identify patients with pyuria associated with infection.

In conclusion, the application of the micronucleus test to epithelial cells of various human tissues will provide evidence of exposure to carcinogens and clastogens. The detection of E. coli in urine, early

antibiotics and doses, early treatment may help to reduce the level of DNA damage.

Keywords: Micronucleus, Urinary tract, DNA damage, Escherichia coli

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Poster No. 15

8-hydroxy 2-deoxyguanosine levels in patient with diabetic and non-diabetic acute ischemic stroke

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8-hydroxy 2-deoxyguanosine (8-OH-dG) is a marker of the oxidative damage of DNA. Several studies have shown that oxidative stress is associated with stroke and diabetes (Lien et al. 2017; Chen et al. 2018; Liu et al. 2018). The aim our study was to investigate the effect of diabetes on serum 8-OH-dG levels in acute ischemic stroke.

In this case-control study 50 patients who had a stroke for the first time in their life and 30 healthy controls, a total of 80 individual were included. The 50 stroke patients were divided into two groups as 27 diabetic and 23 non-diabetics. Serum levels of 8-OH-dG were measured by commercial ELISA kits. The Kruskal-Wallis test was used to analyze the relationship between the patient groups and the control group variables. Two-handed comparisons were made using the Mann-Whitney U test.

8-OH-dG values were measured as 298.12 ± 113.37 ng/ml in diabetic stroke cases, 276.30 ± 103.15 ng/ml in non-diabetic stroke cases and 201.79 ± 42.21 ng/ml in control group (Mean± SD). 8-OH-dG levels were significantly higher in patients with ischemic stroke, than controls. In addition, when the diabetic and non-diabetic ischemic stroke patients were compared, the 8-OH-dG levels of the diabetic group were significantly higher than the non-diabetic patients.

In patients with ischemic stroke, significant interactions have been identified between high 8-OH-dG levels and diabetes mellitus and hypertension as proven risk factors, According to the results obtained from the study, it can be concluded that diabetic ischemic stroke patients have a higher risk of exposure to oxidative stress.

Keywords: Ischemic Stroke, Oxidative Stress, Diabetes Mellitus, 8-hydroxy 2 deoxyguanosine

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Poster No. 16

TRPV4 heats ups ANO1-dependent exocrine gland fluid secretion

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Several ion channels and transporters regulate fluid secretion in salivary and lacrimal glands. In salivary glands, the major anion channel involved in fluid secretion is the calcium-activated chloride channel anoctamin 1 (ANO1). Several members of the transient receptor potential (TRP) channel superfamily regulate ANO1 activity. Here, we report a functional interaction between thermosensitive TRPV4 and ANO1 in acinar cells isolated from mouse salivary and lacrimal glands.

By using calcium and calcein imaging as well as patch clamp techniques, we showed that TRPV4 activation induced chloride currents and shrinkage of acinar cells by increasing intracellular calcium concentrations. The chloride currents evoked by a TRPV4-specific activator (GSK1016790A) were identified as ANO1-mediated currents. Moreover, TRPV4 activation by an IP3-dependent mechanism was found to contribute to the muscarinic pathway of fluid secretion. Muscarinic stimulation of saliva and tear secretion was downregulated in both in acinar cells treated with a TRPV4-specific antagonist (HC-067047) and TRPV4-KO mice. The prandial drinking behaviour of TRPV4-KO mice was also altered compared to their wild type counterpart, suggesting a default of salivation. Furthermore, the temperature dependence of muscarinic salivation was shown to depend mainly on TRPV4.

In conclusion, our results suggest that TRPV4 interacts with IP3 receptors and ANO1 to regulate the muscarinic pathway that mediates salivation and lacrimation. We propose that interactions between TRP channels and anoctamins may occur in all tissues that perform secretory functions, and that regulation of fluid secretion through the modulation of TRP channel activity could offer new strategies for treating exocrine gland diseases.

Keywords: calcium; ion channels; saliva; tears.

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Poster No. 17

Enhanced SOCE compensates for reduced calcium influx through voltage-gated calcium channels in mesenteric arteries of aged rats

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Recently we reported that, in rat small mesenteric arteries, aging reduced expression of L-type voltage-gated Ca^{2+} channels (LTCCs), Ca^{2+} influx and the vasodilatory response to LTCCs blockers. However, the contractility of these arteries to phenylephrine (PE) was not altered. The aim of this work was, therefore, to investigate the mechanism(s) contributed to the

preservation of PE-induced contractile response. Isometric tensions of small mesenteric arteries (MA) from two groups of F344 rats, young (MA-Y, age 3-4 months) and old (MA-O, age 22-26 months) were recorded using wire myograph. Cumulative contraction-concentration response curves of PE (0.01- 30 µM) were obtained. Western immunoblotting was performed to compare expression levels of IP3R1, SERCA2, STIM1 and Orai1 protein. SERCA blocker, thapsigargin (1µM) significantly reduced PE-induced contractions. However, the reduction was less pronounced in MA-O than MA-Y. SOCE-mediated contractions were significantly more in MA-O compared to MA-Y. Caffeine (10 mM) produced similar magnitude of contractions in both groups. IP3 receptor blocker (2APB, 50 µM and Xestospongin C, 5µM) significantly reduced PE-induced contractions in both groups. However, the difference between the two groups was insignificant. The expression level of IP3R1, SERCA, STIM1 and Orai1 was higher in arteries from MA-O compared to MA-Y.

In conclusion, our results suggest that, ageing enhanced influx of Ca^{2+} through SOCE, a mechanism that may have contributed, at least in part, to preservation of PE-induced contractions.

Key words: Aging, SOCE, mesenteric arteries, sarcoplasmic reticulum, STIM1 and Orai1

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Poster No. 18

Protective effect of curcumin on apoptotic cell following exposure to compact fluorescent lamps in male rats

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Compact fluorescent lamps (CFLs) could be a source of harmful ultraviolet (UV) radiation. The UV radiation has a potent effect on biological organism. Exposure of the skin to UV radiation induces inflammation, DNA damage and skin cancer. We aimed to assess disorders evoked by CFLs and possible protective effects of curcumin on the skin rats.

In this study, 24 hairless adult male Wistar rats were divided into three equal groups: control group; without curcumin and CFLs exposure, fluorescent group; treated with 12 h CFLs exposure for 15 days, and fluorescent with curcumin group; treated with 12 h CFLs exposure with injection of curcumin 20 mg/kg, IP, daily for 15 days. At the end of experiment the animals were anesthetized. The blood samples were collected from the right atrial of rats into glass tubes without any anticoagulants. The serum was isolated from the blood sample and TNF-α was measured. The skin was removed for assessment of H&E and TUNEL staining.

Serum level of TNF-α was significantly increased after exposure to CFLs ($p<0.0001$). In addition apoptotic cell and morphological changes were observed. Administration of curcumin during CFLs prevented this alteration.

In conclusion, the CFLs for a long time caused apoptosis, increase of inflammation factors and disturb of skin. But curcumin as anti-inflammation and oxidative stress has protective effect on complication of CFLs to skin of rat.

Keywords: Compact fluorescent lamps; Ultraviolet radiation, skin; Inflammatory factors; Apoptosis; Curcumin

Poster No. 19

Long time exposure to compact fluorescent lamps (CFLs) induce oxidative stress in rat livers

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Fatty liver disease (FLD) is a worldwide public health problem, and it can be caused by numerous factors. The aim of this study was to investigate the exposure to compact fluorescent lamps (CFLs) as one of the possible factors contributing to the development of FLD.

Twenty four adult male Wistar rats were randomly divided into three groups: control group (without fluorescent light exposure), and two fluorescent groups (12 h exposure to fluorescent light per day for 10 days [short time (ST)] and 35 days [long time (LT)], respectively). The rats were anesthetized with pentobarbital at the end of experiment. The levels of aspartate aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transferase (GGT), alkaline phosphates (ALP), glucose (GL), triglyceride (TG), total bilirubin (TB), low-density lipoprotein (LDL), and cholesterol in serum were then determined. The livers of rats were collected for observing pathologic changes.

Serum levels of liver enzymes were significantly increased after LT exposure to CFLs ($P<0.05$). In addition, Serum levels of GL, TG, TB, LDL, and cholesterol were increased. As well as fat accumulation inside hepatic cells led to an increase in volume of these cells.

In conclusion, the CFLs exposure led to FLD and elevation of biochemical indices related to the liver disorders. It was shown that the duration of exposure to CFLs had an important effect on biochemical indices of liver. This disorder is likely the consequence of oxidative stress produced by UV radiation that emitted by CFLs.

Keywords: Compact fluorescent lamps, Liver, Fatty liver disease, Liver enzymes, Ultraviolet radiation.

Poster No. 20

Biophysical properties of ERG channels in bushy neurons in the cochlear nucleus

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ERG (Ether a go go related gene) channels (Kv 11) are an ion channel group belonging to the voltage dependent potassium channel family. Although expressed in many tissues, the physiological roles of ERG channels are best demonstrated in cardiac ventricular cells. The aim of this study is to isolate the currents of the ERG channels and determine their biophysical properties in the bushy neurons in the cochlear nucleus (CN).

A total of 50 mice at 14-17 day-old were used for this study. Electrophysiological characterization of ERG channels was performed using patch clamp technique in the CN slices. In current clamp, application of ERG channel blockers in both cells, terfenadine (10 μM) and E-4031 (10 μM), significantly increased input resistance ($p<0.05$). They also significantly reduced threshold for induction of APs by current injection ($p<0.05$).

Tail ERG currents were measured under voltage-clamp. Steady state activation curve for ERG tail current was determined with a half-activation voltage in bushy cell $V_{0.5}$ -49.5 mV with a slope factor of 7.51 mV. The quasy steady-state inactivation curve for chord conductances gave for Bushy cell $V_{0.5}$ value of -78.80 and the slope of 10,45.

In conclusion, the findings obtained in the present study suggest that bushy neurons express ERG channels and appear to contribute to setting AP frequency, threshold for AP induction and, possibly, resting membrane potentials in this cells.

Keywords: ERG channels; Bushy neurons; Potassium Channels; Patch-clamp.

Poster No. 21

The Effects of CAPE on oxidative stress and histopathological values in rats treated with subacute dichlorvos

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This study was designed to investigate the protective effect of caffeic acid phenethyl ester (CAPE) against dichlorvos induced hepatotoxicity in rats. 40 rats were used in the study, including 10 in each group. Corn oil of 5 mg/kg (solvent) was administered intragastrically to rats in the group 1, dichlorvos of 5 mg/kg was dissolved in corn oil and administered to rats in the group 2 via gavage, dichlorvos (5 mg/kg, via gavage route) and CAPE (10 µM/kg, intraperitoneally) were administered to rats of the group 3 with one-hour interval providing that CAPE treatment was started three days earlier than dichlorvos administration. The rats in the group 4 were administered with 10% solvent ethanol via intraperitoneally. All administrations continued for 15 days and blood of animals was drawn via intracardiac route after they were sacrificed by cervical dislocation under ketamine/xylazine anesthesia. Total antioxidant, total oxidant, and paraoxonase levels were measured from the obtained plasma samples. As a result of dichlorvos administration, paraoxonase activity and total antioxidant levels decreased; whereas, total oxidant levels increased. Histopathological analysis revealed that liver tissue appeared normal in control groups (1 and 4); on the other hand, there were degeneration, congestion, cellular infiltration, and necrotic areas in the group administered with dichlorvos. Even though frequency of lesions decreased, similar lesions were observed in the group with Dichlorvos+CAPE. Consequently, it was determined that while dichlorvos administration increased oxidative stress, CAPE administration had a protective potential increasing antioxidant capacity.

Keywords: Dichlorvos; CAPE; Hepatotoxicity; Oxidative stress; Subacute administration.

Poster No. 22

Histopathological and biochemical responses to the oxidative stress induced by glyphosate-based herbicides in the Rainbow Trout (Oncorhynchus mykiss)

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This study aimed to determine the effects of glyphosate, a herbicide commonly used in weed control, on aquatic life. For this purpose, 30 one-year-old rainbow trout with an average weight of 150-165 g were obtained from a local trout production station in Mazmanlı (Hatay, Turkey) and transferred to our laboratory, where they were allowed to adapt to the new environment in polyethylene tanks approximately for 7 days. Three groups each containing 10 fish were formed: a control group with no treatment, the group treated with 1.25 mg L^{-1} glyphosate-based herbicide (GBH), and the group treated with 2.5 mg L^{-1} glyphosate-based herbicide. At the end of 14 days of treatment, blood samples were taken from the caudal vein of the fish under anaesthesia, and their sera were separated. Total oxidant/antioxidant levels and paraoxonase activity were analysed in the obtained serum samples. Also, for histopathological examination, gill tissues were removed and fixed in 10% buffered formalin. After the fixation and routine tissue processing (graded alcohols, methyl benzoate and benzol processing), the tissues taken were embedded in paraffin and 5 µm serial sections were taken by microtome from the blocks to slides pre-coated with chrome alum gelatine. Histopathological changes were

examined at the light microscopic level by staining the sections with haematoxylin-eosin. According to the evaluation of the biochemical parameters obtained from the groups, antioxidant capacity and paraoxonase activity decreased and oxidant level increased in the group treated with 1.25 and 2.5 mg L^{-1} glyphosate-based herbicide as compared with the control group. In the histopathological examination of the sections, it was observed that the primary and secondary lamellae had a normal structure in the gill sections obtained from the control group. Irregular secondary lamellae and epithelial hyperplasia were observed in the gill sections obtained from the group receiving 1.25 mg L^{-1} GBH. And in the gill sections obtained from the group receiving 2.5 mg L^{-1} GBH, swelling in chloride cells, degeneration in secondary lamellae, and areas of necrosis were detected. This study suggests that glyphosate, which is widely used in agricultural activities and has a potential to leak into aquatic ecosystems, may cause oxidative stress due to reactive oxygen species formed in the rainbow trout, and may therefore has a toxic effect.

Keywords: Oncorhynchus mykiss, Glyphosate-based herbicide, Oxidative stress, Histopathology, Gill.

Poster No. 23

The effect of chrysin on the actions of diesel exhausts particles in rats with experimental chronic kidney disease

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There is a strong evidence for an association between exposure to particulate air pollution (PAP) and several chronic diseases including kidney diseases. Therefore, this study aimed to investigate the possible protective effect of the flavon chrysin on the adverse effects of a common PAP (viz, diesel exhaust particle, DEP) in rats with adenine – induced chronic kidney disease. Rats were divided into 8 groups: control (C), adenine (0.25% in feed), DEP (0.5 mg/kg), chrysin (100 mg/kg), and different combinations with these agents, given daily for 35 consecutive days. Thereafter, urine, plasma, lungs and kidneys were collected and used in various physiological, biochemical, histopathological and histochemical measurements.

Adenine lowered body weight, and increased water intake, relative kidney weight and urine output. It decreased creatinine clearance and elevated the plasma concentrations of some inflammatory cytokines, urea, creatinine, nitrite, nitrate and neutrophil gelatinase-associated lipocalin activity, as well as the uremic toxins indoxyl sulfate, uric acid and phosphorus. In urine, adenine increased the albumin and endothelin /creatinine ratio, kidney injury molecule and N-Acetyl-beta-D-glucosaminidase activity. Renal histopathological markers of inflammation and fibrosis were significantly increased, and renal activities of oxidative stress indices were all reduced. Concomitant treatment with adenine and DEP exacerbated the histological pulmonary and renal damage and some, but not all, biochemical induces caused by either agent. Chrysin treatment significantly abrogated most of adenine and adenine +DEP actions, suggesting that, pending further pharmacological and toxicological studies, it may be a useful supplement in CKD patients, especially those exposed to air pollution

Keywords: Adenine, air pollution, chronic kidney disease, chrysin, diesel exhaust particle, oxidative stress

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Poster No. 24

Calcium signaling and TRP channels as a potential drug targets in Toxoplasma gondii

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Toxoplasma gondii (T. gondii) is a mandatory cellular protozoan parasite that replicates in the intestines of specific hosts including cats and other felidae. This parasite infects a wide range of intermediate hosts, including mice and humans. T. gondii, an apicomplexan parasite, resides in approximately one-third of the world's human population. Up to 30% of humans are chronically infected with T. gondii.

Calcium (Ca^{2+}) channels regulate many important functions within cells. Ca^{2+} is also relevant for several vital functions in apicomplexan parasites T. gondii, including host cell invasion, parasite motility and differentiation. Endoplasmic reticulum, acidocalcisomes, mitochondria and plant-like vacuole are important calcium stores for T. gondii. Other unexplored sources of (Ca^{2+}) in T. gondii are Golgi complex, apicoplast, inner membrane complex, and secretory organelles. Extracellular Ca^{2+} concentration was assessed between 60-100 nM in T. gondii. Calcium homeostasis is in balance in parasite and mammalian cells. A SERCA-type Ca^{2+}-ATPase, which is present in the ER is the main Ca^{2+} uptake mechanism in this compartment. Acidocalcisomes of T. gondii possess a PMCA-type Ca-ATPase and Ca^{2+}/H exchanger for Ca^{2+} uptake. Moreover, Ca^{2+}/H^{+} antiporter is apparently present in the mitochondria. All together the channels mentioned provide intracellular and extracellular Ca^{2+} homeostasis of T. gondii. The presence of TRP channels in parasites was investigated by bioinformatics analyzes compared with those in humans. However, there is insufficient information about these mechanisms and channels in the calcium entry at T. gondii. Particularly, TRP channels playing a crucial role for calcium signalling, ion homeostasis, and other cellular functions such as motility, secretion, invasion and virulence, are almost entirely unexplored in apicomplexan parasites.

In conclusion, a role for Ca^{2+} in the action of some anti-parasitic drugs has been known for a long time. However, the Ca^{2+} and TRP channels regulate crucial processes in parasites and may damage the parasites by impairing calcium homeostasis. It can represent attractive new therapeutic targets for T. gondii. Therefore, further studies are required in this issue.

Keywords: Toxoplasma gondii, calcium homeostasis, Ca^{2+} and TRP channels, new drug targets

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Poster No. 25

Malondialdehyde and myeloperoxidase levels in patients with obstructive sleep apnea syndrome

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Obstructive sleep apnea syndrome (OSAS) is a syndrome characterized by recurrent partial or complete upper respiratory tract obstruction resulting in hypoxia/reoxygenation and arousal during sleep

(Gaudette and Kimoff, 2010). The diagnosis and severity of OSAS is made by looking at the apnea-hypopnea index (AHI) by polysomnography (AHI >5 OSAS patient) (International classification of sleep disorders, 2014). As a result of oxidative stress in OSAS patients, reactive oxygen species may increase and damage the cellular level (Christou et al. 2003). Malondialdehyde (MDA) is an indicator of oxidative stress in lipid membranes (Christou et al. 2003). Myeloperoxidase (MPO) is also used as an indicator of oxidative damage in the tissues.

Subjects were measured over night with Compumedics (44-channel E-series, Australia) polysomnography (PSG). 60 patients (AHI> 5) and 30 controls (AHI <5) were accepted for a total of 90 subjects. Oxygen saturation (SaO2), AHI and Oxygen desaturation index (ODI) values were recorded after the measurement with PSG.

Venous blood samples were collected from all subjects. After centrifugation, serums were obtained. Each of these serum samples was tested for the presence of MDA (SunRed, China) and MPO (SunRed, China) by ELISA method. These tests were performed by commercial kits according to the manufacturer's instructions.

There was a statistically significant increase in AHI and ODI in the patient group and SaO2 in the control group when OSAS patients and control group were compared with AHI, ADI and SaO2 ($p < 0.001$). However, there was no difference between MDA and MPO serum levels, which increased oxidative stress activity ($p > 0.05$).

In conclusion, despite the decrease of oxygen saturation in OSAS patients, we determined that serum MDA and MPO levels did not change. These results suggest that oxidative damage may not have occurred in OSAS patients, which may cause damage at the cellular and tissue level.

Keywords: Obstructive sleep apnea syndrome, MDA, MPO

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Poster No. 26

Bisphenol A induces oxidative stress and apoptosis through TRPM2 channel activation in mouse kidney cortical collecting duct cells: Protective effect of resveratrol

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Ca^{2+} is a versatile intracellular signal that operates over a wide range to regulate many different cellular physiological and pathophysiological processes such as apoptosis and oxidative stress. TRPM2 is activated by oxidative stress (Sumoza-Toledo and Penner, 2011) and it has emerged as an important Ca^{2+} signaling mechanism in a variety of cells, contributing many cellular functions including cell death. In our modern life, the exposure to bisphenol A (BPA) that especially due to the widespread use of water in plastic pet bottles is a hidden danger that must be taken seriously (Honeycutt et al. 2017). This BPA-containing water that we consume on a daily basis passes through the (cortical collecting duct) CCD cells in our kidneys and the BPA induced oxidative stress in different cells except kidney cells. But the BPA-induced transient receptor potential melastatin 2 (TRPM2)-mediated oxidative stress and apoptosis in these cells has not been studied yet. The current study aimed to elucidate the effect of antioxidant resveratrol on TRPM2 mediated oxidative stress induced by BPA exposure in the mouse kidney cortical collecting duct cells (MPKCCD).

The cells were divided into 4 groups as control, resveratrol (50 µM for 24 hour) (Naylor et al. 2011), BPA (100 µM for 24 hour) and BPA+resveratrol.

Intracellular free Ca^{2+} concentration and TRPM2 channels currents were high in the MPKCCD cells, although they were decreased by the resveratrol treatment. In addition, BPA-induced mitochondrial membrane depolarization, reactive oxygen species (ROS), caspase 3, caspase 9 and apoptosis values were decreased by the resveratrol treatment.

In conclusion, this study reveals the protective effect of resveratrol against oxidative stress and apoptotic cell death induced by TRPM2 dysregulation in MPKCCD cells exposed to BPA.

Keywords: Bisphenol A; TRPM2; Apoptosis; Calcium signaling; Oxidative stress.

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Poster No. 27

Alpha lipoic acid decreases hypoxia-induced apoptosis, inflammation and mitochondrial oxidative stress through inhibition of TRPA1 and TRPV1 channels in human glioma cell

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Apoptosis, overload Ca^{2+} entry and oxidative stress are induced by hypoxic conditions. Cancer stem cells and drug-resistant tumor cells are killed by hypoxic conditions. α-Lipoic acid (ALA) has antioxidant and oxidant properties. Recently we observed increased level of apoptosis, oxidative stress and TRPV1 activation in breast cancer cells by the ALA treatment. The aim of this study was to evaluate if a combination therapy of ALA with hypoxia can alter the effect of this hypoxia in the human glioblastoma (DBTRG) cells.

The DBTRG cells were divided into four treatment groups as control, ALA (50 mM), and hypoxia and hypoxia+ALA. Hypoxia in the cells was induced by $CoCl_2$ (200 mM).

Apoptosis, mitochondrial membrane depolarization (JC1), reactive oxygen species (ROS) production, IL-1b, IL-18, caspase 3 and 9 levels are increased through activating TRPA1 and TRPV1 in the cells by the hypoxia induction, although cell viability, reduced glutathione (GSH) and glutathione peroxidase (GSH-Px) values were decreased by the treatments. However, the cell viability, GSH and GSH-Px values were decreased in the cells by TRPA1 (AP18) and TRPV1 (capsazepine) blockers, and ALA treatments, although ROS, JC1, apoptosis, IL-18, caspase 3 and 9 levels were decreased by the ALA treatment.

In conclusion, apoptosis, inflammatory and oxidant effects of hypoxia were increased by activation of TRPA1 and TRPV1 channels, but its action on the values was decreased by the ALA treatment. ALA treatment could be used as an effective strategy in the treatment of hypoxia-induced oxidative stress and inflammation.

Keywords: α-Lipoic acid, Apoptosis; Glioblastoma cells; Inflammation; Hypoxia; TRPA1.

Poster No. 28

The investigation of the effect of propolis on nitrosative stress in the brain tissue of rats exposed to total head irradiation

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The aim of this study is to investigate the radioprotective effects of propolis on the brain tissue of rats exposed to ionizing radiation, and its ability in reducing nitrosative stress resulting from ionizing radiation.

Thirty six male Wistar-Albino rats were used in the study. The study groups consisted of 4 subgroups: 2 control groups, one irradiation only group (IR), and the last group is both IR exposed and propolis administered. All of the groups except the control groups received a single dose of 5 Gy on the first day of radiotherapy. Nitrosative stress parameters in the brain tissue were measured by spectrophotometry to determine whether protective effects of propolis were present. It was determined that NO, $ONOO^-$ values and NOS activity were significantly higher in the brain tissue of the rats in the radiotherapy only group in comparison to the both propolis and irradiation treated group.

In conclusion, these findings suggest that the use of propolis has a protective effect against the adverse effects of nitrosative stress caused by ionizing radiation. However, to be assured of these beneficiary effects of propolis should be supported by further pharmacological and toxicological researches.

Keywords: Irradiation; Propolis; Nitric oxide; Nitric oxide synthesis; Peroxynitrite.

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Poster No. 29

The effects of diazinon on histopathology of gill tissue in rainbow trout (Oncorhynchus mykiss)

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This study was done to investigate the effects of diazinon on gill histopathology in rainbow trout (Oncorhynchus mykiss). 10 fish (for each group) were subjected to 0.15mg/L and 0.30 mg/L of Diazinon. Gill tissues of fish were kept in a 10% formalin solution. They were routinely surveyed by an automated tissue monitoring device. Then, 4 µm thick sections were taken from gill tissues blocked with paraffin. Sections taken from the gill tissues were stained with Hematoxylin-Eosin (HE) dye and they showed as none (−), mild (+), moderate (++) or severe (+++) under a light microscope (Bar: 20µm) (Birincioğlu et al. 2011). While 0.15 mg/L of diazinon were led to epithelial hyperplasia in the range interlamel, inflammation, hyperemia in the gill tissues when compared to control group, 0.30 mg/L of Diazinon caused severe epithelial hyperplasia in the range interlamel, inflammation, lammellar edema, hyperaemia in vessels and telangiectasia. As a result, diazinon caused important alterations in the gill histopathology of rainbow trout.

Keywords: Rainbow trout; Diazinon; Histopathology

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Poster No. 30

Protective effects of 4-Hydroxy-Tempol on ischemia-reperfusion injury of rat kidneys

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Free radicals have played an important role in the pathophysiology of severel disease including renal ischemia/reperfusion (I/R) injury (Joseph et al. 2011). The aim of this study was to estimate any cytoprotective effects of 4-hydroxy-tempol that scavenging reactive oxygen species on the tissue damage during ischemia/reperfusion injury of kidney.

Forty Male Wistar-Albino rats were divided into four groups of equal numbers: Group 1; no I/R, no tempol; Group 2; no I/R, but with tempol; Group 3; I/R without tempol; and Group 4; I/R with tempol. I/R were induced by 60-min clamping of the bilateral renal artery. Tempol (300 μmol/kg/h/i.v) was administered 30 min before induction of I/R. At the end of the reperfusion period (at 24th hour), rats were sacrificed and then the kidneys of rats were received. The kidney tissue samples were washed to chop into pieces of approximately 1 mm3 in cold phosphate buffered saline (PBS). Detection of apoptotic cells was performed by annexin/propidium iodide (Annexin/PI) staining. The ratios of living cells, apoptotic and necrotic cells early and late apoptotic cells were determined.

When I/R group was compared with non-ischemia control group, necrotic, apoptotic cell percentage increased ($p<0.001$), but total alive cell percentage decreased ($p<0.001$). Nevertheless, it was observed that alive cell percentage was significantly ($p<0.001$) increased when I/R+Temp group was contrasted with the group to which I/R was applied. The percentage of necrotic and apoptotic cells decreased significantly ($p<0.001$) was detected.

In conclusion, the oxidative stress in the kidney ischemia/reperfusion injury may play an important role and application of 4-hydroxy-tempol may improve tissue damage.

Keywords: Rat renal ischemia/reperfusion, Flow cytomctry, 4-hydroxy-tempol, Apoptosis, Oxidative stress

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Poster No. 31

The neuroprotective effect of selegiline in streptozotocin induced diabetic rats

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Various complications may develop in diabetes for a long time. One of these complications is diabetic neuropathy. The neuroprotective effect of selegiline was determined in tissue culture and animal models. The aim of this study was to investigate the neuroprotective, DNA preservative antioxidant effects of selegiline with streptozotocin induced diabetic rats.

40 male Wistar albino rats were used. Experimental diabetes was induced with 50 mg/kg intraperitoneal injection of streptozotocin. Rats with 200 mg/dL ≥ plasma glucose levels were accepted as diabetic. Negative control (non diabetic), positive control (diabetic) and selegiline (5 mg/kg, 10mg/kg, 20 mg/kg) groups were established in the study. Selegiline was administered to the rats with intra gastric tube during 21 days. Body weight of rats was diminished in diabetic groups compared with the negative control

group (P<0.01). HbA_{1c} level of selegiline of the 20 mg/kg group was lower than the other groups (P<0.05). Proximal and distal amplitude measures of diabetic groups were lower than the negative control group (P<0.05). DNA tail intensity and DNA tail moment values were lower in the selegiline groups compared with the positive control group (P<0.01). Antioxidant parameters (SOD, CAT, GSH) were increased and oxidant parameter (MDA) was diminished in the brain and liver tissues of selegiline 20 mg/kg group (P<0.01).

This gathered findings suggest that selegiline administered at 20 mg/kg dose may be effective in reducing diabetic oxidative stress, DNA damage and HbA1c levels.

Key words: Selegiline; Streptozotocin; Diabetes mellitus; Neuropathy; EMG.

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Poster No. 32

Antioxidative effect of oleuropein on indomethacin-induced gastric ulcer in rats

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Oleuropein is the most prevalent phenolic component in olive leaves, seed, pulp and peel of unripe olives. Oleuropein's antioxidant potential is mainly related to its ability to improve radical stability through the formation of an intramolecular hydrogen bond between the free hydrogen of the hydroxyl group and its phenoxyl radicals. Indomethacin, one of the most prescribed nonsteroidal anti-inflammatory drug, can cause oxidative damage in gastric tissue. Here, we investigated the anti-oxidative properties of oleuropein in rats with indomethacin induced gastric ulcer.

A total of 56 adult male Wistar rats were divided into seven groups of eight animals as follows: control, indomethacin 25 mg/kg, oleuropein 12 mg/kg, lansoprazole 30 mg/kg as well as indomethacin 25 mg/kg with oleuropein 6 mg/kg, oleuropein 12 mg/kg and oleuropein 18 mg/kg. Gastric ulcers were induced by oral administration of indomethacin, after which the differing doses of oleuropein were administered by oral gavage. The efficacy of oleuropein was compared with lansoprazole. Activities of superoxide dismutase, catalase and myeloperoxidase, as well as malondialdehyde and glutathione levels were determined in stomach tissue. Samples of the stomach tissue were also taken for pathological investigations. Histopathological method was used to detect morphological damage.

The results showed that 18 mg/kg oleuropein significantly decreased high malondialdehyde level and myeloperoxidase activity, and increased the activity of antioxidant enzymes (with the exception of catalase) in tissue. Tissue damage in the stomachs of the rats correlated with the biochemical and histopathological findings.

In conclusion, these results indicated that oleuropein might have a protective effect against indomethacin induced gastric ulcer and oxidative stress in rats.

Keywords: Oxidative stress; Oleuropein; Gastric Ulcer

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Poster No. 33

Effects of TRPV1 antagonist AMG-9810 on proliferation of breast carcinoma cells

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Transient Receptor Potential Vanilloid 1 (TRPV1) is the most investigated member of the TRP superfamily of ion channels which is expressed on many different cell types (Benham et al 2002). When TRPV1 is activated, calcium influx takes place and cell-specific intracellular changes occur. The functions of TRPV1 has not been clarified in cancer cells yet (Tominaga et al, 1998; Fernandes et al, 2012). There are few studies examining the relationship between TRPV1 and breast cancer. In this study we investigated the effects of TRPV1 antagonist AMG-9810 on proliferation of liver (4TLM), brain (4TBM) and heart (4THM) metastatic and non-metastatic (67NR) breast carcinoma cells.

67NR, 4TLM, 4TBM and 4THM carcinoma cells were cultured with DMEM-F12 (%5 FBS) (Erin et al, 2013). TRPV1 agonists and antagonists used for cell treatment. Extents of proliferation of the cells were determined with WST-1 test, 72 hours after treatment. TRPV1 agonist capsaicin was effective at inhibiting cell proliferation but antagonists were generally more effective and AMG-9810 was most effective agent.

In conclusion, all four breast carcinoma cells responded well to TRPV1 antagonist AMG-9810. Further studies are required to determine the mechanisms of antitumor effects of AMG-9810 under both in-vitro and in-vivo conditions.

Keywords: TRPV1, breast cancer, 67NR, capsaicin, AMG-9810.

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Poster No. 34

Antioxidant and anti-proliferative activities as well as phytochemical profile of Gypsophila lepidioides

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Phenolic compounds gained great interest due to their preventative role against certain diseases such as diabetes, Alzheimer diseases and cancer. Therefore recent studies have focus on the investigation of bioactivity of phenolic compound found in plant. In this study, we aimed to determine the phenolic composition of Gypsophila lepidioides as well as its antioxidant and anti-cancer potentials. Phenolic and flavonoid content of the extracts were determined by Folin ciocalteu method and Aluminium chloride colorimetric method, respectively. In addition, HPLC technique was used to

detect the most abundant individual phenolic compounds in G. Lepidioides.

In order to determine the antioxidant activity of the species, water and methanolic extracts were prepared and four assay, namely ABTS, DPPH CUPRAC and Fe^{2+} chelating activity assays, were performed. For anticancer activity, the extracts were tested against three cancerous cell lines namely, human breast carcinoma MCF-7 cells, colorectal carcinoma HT-29 cells and hepato carcinoma HepG2 cells by XTT cell proliferation assays.

The result showed that, in parallel to the total phenolic and flavonoid contents, methanolic extract of G. Lepidioides showed higher antioxidant activity, except for CUPRAC assay, as compared to water extract in all antioxidant assays. IC_{50} (mg/ml) values for methanolic extract of G. Lepidioides were 0,556 mg/ml, 145,79 µg/ml and 0,551 mg/ml for DPPH, ABTS and Fe^{2+} chelating activity of G. Lepidioides, respectively. HPLC analsysis indicated that the most abundant individual phenolic compounds in water extact of G. Lepidioides are pyrogallol (0,160 µg/g ext.), 3,4-dihidroxybenzoic acid (0,133 µg/g ext.) and p-hidroxybenzoic acid (0,0086 µg/g ext). Similarly, methanolic extract was found to contain pyrogallol (0,715 µg/g ext.), 3,4- dihidroxybenzoic acid (0,170 µg/g ext.) and p-hydroxybenzoic acid (0,0262 µg/g ext.) as well as vanillin (0,0166 µg/g ext.). Parallel to the antioxidant activity, methanolic extract of G. Lepidioides indicated a better anti proliferative activity against MCF-7, HT-29 and HepG2 cells with IC_{50} (mg/ml) values of 1,11 mg/ml 0,644 mg/ml and 0,772 mg/ml, respectively. The result of this study suggest that G. Lepidioides has moderate bioactivity with four major phenolic content.

Keywords: Gypsophila lepidioides; Antioxidant; Anti-proliferative activities; Phytochemical profile.

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Poster No. 35

Delivering growth factors through a polymeric scaffold to cell cultures containing both nucleus pulposus and annulus fibrosus

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The aim of this in vitro experimental study was to design a novel, polyvinyl alcohol (PVA)-based polymeric scaffold that permits the controlled release of insulin-like growth factor 1 (IGF-1)/bone morphogenetic protein -2 (BMP-2) following intervertebral disc administration.

The drug delivery system was composed of two different solutions that formed a scaffold within seconds after coming into contact with each other. We performed swelling, pH, and temperature tests and analysis of the controlled release of growth factors from this system. The release kinetics of the growth factors was determined through enzyme linked immunosorbent assay (ELISA). Cell proliferation and viability was

monitored with microscopy and analyzed using an MTT assay and acridine orange/propidium iodide (AO/PI) staining. Chondroadherin (CHAD), hypoxia inducible factor-1 alpha (HIF-1α), and collagen type II (COL2A1) gene expressions were determined with quantitative real-time polymerase chain reaction (qRT-PCR) analysis to show the effects of IGF-1/BMP-2 administration on annulus fibrosus cell (AFC)/nucleus pulposus cell (NPC) cultures. For the statistical evaluation of the obtained data, experimental groups were compared with a post hoc Tukey's test following an analysis of variance.

The scaffold allowed for the controlled release of IGF-1 and BMP-2 in different time intervals. It was observed that as the application time increased, the number of cells and the degree of extracellular matrix development increased in AFC/NPC cultures. AO/PI staining and an MTT analysis showed that cells retained their specific morphology and continued to proliferate. It was observed that HIF-1α and CHAD expression increased in a time-dependent manner, and there wasn't any COL2A1 expression in the AFC/NPC cultures.

In conclusion, the designed scaffold may be used as an alternative method for intervertebral disc administration of growth factors after further in vivo studies. We believe that such prototype scaffolds may be an innovative technology in targeted drug therapies after reconstructive neurosurgeries.

Keywords: Annulus fibrosus; BMP-2; IGF-1; Intervertebral disc diseases; Nucleus pulposus; polymeric Scaffold; Primary cell culture.

Poster No. 36

Investigating the age dependent changes in the vascular response to cold

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The biphasic vascular response to cold involving vasoconstriction followed by vasodilation is a well-established physiological response against cold developed to prevent heat loss. In ageing, this response starts to malfunction resulting in a rapid loss of body heat, and inability to maintain the core body temperature leads to secondary complications. We have previously shown that TRPA1 plays a primary role in young mice (Aubdool et al., 2014). To elucidate mechanisms underlying these age-dependent changes, we have developed an experimental setup to simultaneously monitor changes in cutaneous blood flow, temperature and tissue oxygen saturation during cold-induced vascular response in hind paws of young (8-12weeks) and aged (48-54weeks) mice using the moorFLPI imager and moorVMS-LDF/moorVMS-OXY system. Following 5min baseline recording, both hind paws were immersed in cold water (4^{o}C) for 5min and all parameters were recorded for 30min post-treatment.

The findings so far are: Cold-induced vasoconstriction is impaired in aged mice compared to young mice ($p<0.01$, $n=8$). The baseline hind paw temperature of aged mice was higher ($p<0.001$, $n=8$) and the recovery of tissue oxygenation following cold exposure was less robust in aged mice. The aged mice had more oxidative damage, determined by the higher formation of 3-nitrotyrosine. The aged mice had more expression of p21, a marker of ageing.

To conclude, cold-induced vasoconstriction is impaired in the aged mice. We will now investigate the role of TRPA1 and TRPM8, and other signalling to dissect out mechanisms involved in the loss of responses in ageing.

Keywords: Cold; vascular response; TRPA1; TRPM8; ageing; temperature.

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Poster No. 37

Implantation of embryo regulates key antioxidant enzymatic system genes in ovine endometrium

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Reactive Oxygen Species (ROS) and their control affect many reproductive physiological processes including implantation and early embryo development. Although previous studies clearly indicated that embryonic secretions, especially interferon-tau, regulate many pathways in the ovine endometrium during the process of the implantation, the role of ROS-scavenging enzymes (key antioxidant enzymatic system) in the implantation has not been fully understood. Therefore, in this present study, we aimed to determine regulation of key antioxidant enzymatic system genes in ovine endometrium at implantation stage of early pregnancy.

For this purpose, endometrial samples were collected from both cyclic (n=4) and pregnant (n=4) ewes on day 16 after mating. Total RNA was extracted from endometrial samples and converted to complementary DNA by using Reverse Transcriptase reaction. Expression profiles of catalase (CAT), glutathione peroxidase 2 (GPX2), Kelch-like ECH-associated protein 1 (KEAP1), NAD(P)H quinone dehydrogenase 1 (NQO1) and Glutathione S-transferase P 1(GSTP1) were assessed by qPCR in duplicate. Data were then analyzed by student t-test and were considered statistically significant when P values were lower than 0.05. While there were no significant changes for CAT, GSTP1, and GPX2 mRNAs, the expression profile of KEAP1 mRNA was upregulated on day 16 of pregnancy, compared to cyclic day 16 ($P<0.05$). In contrast, pregnancy suppresses expression of NQO1 mRNA on day 16 ($P<0.05$). As a result, expression profiles of key antioxidant enzymatic system genes were described in the ovine endometrium during the implantation by the present study.

According to those results, it could be suggested that an involvement of key antioxidant enzymatic system genes in the embryonic implantation mechanism in ovine endometrium, as indicated by differential expression levels of some those.

Key words: Key antioxidant enzymatic system genes; Implantation; Endometrium; Ewe.

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Poster No. 38

Effect of zinc on oxidative stress induce by hypercapnia in HEK293 cells

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TRP-Melastatin-2 from the Transient Receptor Potential (TRP) family is a non-selective cation channel that is permeable to calcium (Ca^{2+}) (Takahashi et al 2010). Hypercapnia increases reactive oxygen species in cells and can cause chain reactions (Cheng 2012). It is shown that zinc (Zn^{2+}) can create a protective effect against oxidative stress (Marreiro et al. 2017). We aimed to investigate the effects of hypercapnia on TRPM2 channels and the antioxidant effects of Zn in the human embryonic kidney (HEK293) cells.

In the current study, we induced three groups as normoxia, hypercapnia and hypercapnia+Zn in transfected HEK293 cells. The cells in the Normoxia (20% O_2 and 5% CO_2 and balance N_2) and hypercapnia (20% O_2 and 10% CO_2 and balance N_2) groups were exposed to these gasses for 30 minutes and 60 minutes while other group was incubated with Zn before being exposed to the gas mixtures. In all groups, the values of lipid peroxidation (LP) were analyzed.

The statistical evaluation showed a significant increase ($p<0.001$) in LP levels in the groups that were exposed to hypercapnia for 30 and 60 minutes, compared to the groups that were exposed to normoxia for 30 and 60 minutes; and a significantly (respectively; $p<0.01$, $p<0.05$) decrease in LP levels in the groups that were incubated with Zn compared to the groups that were exposed to hypercapnia for 30 and 60 minutes. Furthermore, it was shown that oxidative stress rose as the duration of hypercapnia exposure increased.

It was concluded that hypercapnia increased oxidative stress and caused cellular membrane damage, while addition of Zn could protect the cell membrane from these damaging effects.

Keywords: Hypercapnia, oxidative stress, zinc, calcium, TRPM2 channel.

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Poster No. 39

TRPV1 expression changes on immune cells in tumor bearing animals

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There is a complex relationship between cancer and immune system. Cancer cells can inhibit the immune response with their immunosuppressive factors; immune cells can kill the cancer cells with its cytotoxic factors or functions (Owen et al, 2013). Known as capsaicin channel, Transient Receptor Potential Vanilloid 1 (TRPV1) expression on immune cells was shown in several studies. In these studies, the effects of TRPV1 agonists and antagonists on cytokine release in immune cells were reported (Amantini et al, 2004; Bertin et al, 2014). In this study, we investigated the changes in TRPV1 expression on immune cells in tumor bearing mice.

Heart metastatic breast carcinoma cells (4THM) were used to generate breast tumor in female Balb/c mice (Erin et al, 2013). Animals were sacrificed and spleen, lymph nodes and tumor tissues were collected. For control, healthy mice were used. Cells were obtained via cell strainers from collected tissues. Cells were marked with CD11b, CD3e, CD4, CD8a, CD45 and TRPV1 antibodies. All analyzes were conducted on flow cytometer.

Our findings show that healthy mice got approximately %14 TRPV1+ CD3e+ CD4+ cells but in tumor bearing mice this percentage went up to %45 in lymph nodes. TRPV1+ CD11b+ cells which obtained from spleen of tumor bearing mice were at around %70. Also in tumor tissue TRPV1 expressing immune cells were seen.

In conclusion there are noticeable differences of TRPV1 expression on immune cells in tumor bearing animals. Further studies are needed to fully understand the TRPV1 expression changes in breast cancer.

Keywords: TRPV1, breast cancer, 4THM, flow

cytometry

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Poster No. 40

The effects of erdosteine and D vitamin on oxidative stress in renal ischemia reperfusion injury

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Ischemia reperfusion injury is one of the most important pathophysiological mechanisms observed after organ transplantation. The aim of this study was investigated the biochemical and genetic effects of erdosteine (Erd) and vitamin D (VitD) by performing experimental renal ischemia reperfusion (IR) model in rats.

Forty seven Wistar albino rats were classified as Group I: Sham (n=7); Group II: Renal IR (n=10); Group III: Erd+IR (7 days before IR, by oral gavage 50 mg/kg/day Erd; n=10); Group IV: VitD+IR (7 days before I/R, intramuscular 500 I.U/kg/day VitD; n=10); Group V: Erd+VitD+IR (7 days before I/R, by oral gavage 50 mg/kg/day Erd and intramuscular 500 I.U/kg/day VitD; n=10). The animals in group II, III, IV, V were subjected to 60 minutes ischemia and 24 hours reperfusion. At the end of applications, rats were sacrificed and kidney tissues were excised for gene expression and biochemical evaluations.

In biochemical evaluation, it was found that the tissue level of MDA, significantly increased in IR group in comparison with all the other groups ($p<0.001$). SOD, CAT and GSH-Px enzyme measurements significantly decreased in IR group as compared to sham group ($p<0.01$). The significant increases of CAT and GSH-Px were observed in Erd+IR, VitD+IR and Erd+VitD+IR groups when compared to IR group ($p<0.001$). The significant increases of SOD in Erd+IR ve VitD+IR were observed as compared to IR group (respectively; $p<0.001$, $p<0.01$). TRPM6 gene expression level significantly decreased in Erd+VitD+IR group as compared with sham and IR groups separately (respectively; $p<0.001$, $p<0.05$). There was not any statistical significance between groups for TRPM7 gene expression.

In conclusion, We think that applications of Erd, VitD and their combination before IR have protective effects against to renal IR injuries by inhibiting oxidative stress.

Keywords: Ischemia reperfusion; kidney; erdosteine; vitamin D; TRPM6; TRPM7.

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Poster No. 41

The high gleason score in human prostate cancer correlates with the increased expression of TRPM2 and leads to variability in the expression of autophagic-apoptotic genes

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The molecular basis of prostate cancer (PCa), one of the most common types of cancer in men, has not been fully elucidated. Autophagic mechanisms are known to play a role in PCa. Ion channels are important regulators of autophagy (Wang et al. 2016). TRPM2, a calcium-permeable ion channel, is shown as a prognostic marker candidate in PCa (Zeng et al 2010). In this study, we aimed to determine changes in TRPM2 and autophagic-apoptotic gene expression levels in human prostate adenocarcinomas.

Human prostate paraffin block samples were classified according to gleason score (GS) and were divided into control, BPH, GS4, GS5, GS6, GS7, GS8, GS9 and GS10 groups. Autophagic, apoptotic and TRPM2 gene expression levels were determined by qRT-PCR. In addition, TRPM2 was evaluated immunohistochemically for each group.

TRPM2 gene expression levels in human prostate cancer samples increased in parallel with the increase of GS. Also, TRPM2 immunoreactivity increased in high GS groups. Genes involved in different stages of autophagy were found to vary in expression levels from different GS. In particular, ULK2, AMBRA1, BECN1, BARCOR, ATG10, LAMP2 gene expressions were found to increase in all groups. Among the apoptotic genes, the increased BAX and the decreased TP73 mRNA expression levels were detected.

The role of TRPM2 both in inducing autophagy and in the onset and progression of PCa suggests that autophagy-TRPM2 association may take place in the molecular basis of PCa. Our data confirms this idea and suggests that TRPM2-autophagy association may be targeted as a new therapeutic approach in PCa.

Keywords: Prostate Cancer; TRPM2 channel; Autophagy; Apoptosis.

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Poster No. 42

Determination of 3-Nitrotyrosine levels as indicator of oxidative protein damage in patients with metabolic syndrome

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Metabolic syndrome (MS) is an important health problem that affects more and more people in the world. MS, abdominal obesity, hypertension, hyperglycemia, dyslipidemia, and pro-inflammatory status, is an up-to-date public health issue characterized by a combination of related risk factors. Peroxynitrite is a member of reactive nitrogen species and it has harmful effects on lipids, proteins and DNA. In the proteins in the ONOO- cell or in the free tyrosine a nitro group is added to the phenolic ring and 3-nitrotyrosine (3-NT) occurs. 3-NT is an indirect and stable product of protein nitration and

is widely used for nitrosative stress. Due to 3-nitrotyrosine is peroxynitrite's a stable product (an oxidant formed via nitric oxide and superoxide radicals), the measurement of plasma concentration can be used as a determinant of nitric oxide mediated oxidative damage. In the current study, we aimed to determine 3- NT levels of protein damage in individuals with MS.

The study was consisted of two groups as patients with metabolic syndrome (n = 20) and control group with healthy individuals (n = 20). 3-NT levels of protein damage indicator in all groups were determined using HPLC.

As a result, when the data obtained in the study were evaluated, it was found that 3-NT levels of protein damage indicator in patient groups were significantly higher than healthy individuals.

In conclusion, hyperglycemia and inflammation are important components of this disease. And they have been shown to induce oxidative stress as a result of the formation of reactive oxygen species and over activation of NADPH oxidase

Keywords: 3-Nitrotyrosine; Metabolic Syndrome; Oxidative stress.

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Poster No. 43

Determination of oxidative stress sensitivity in some fish in the Obruk dam lake

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The aquatic areas' pollution with heavy metals has seen significant environmental problems in recent years as they have always been biologically active and can easily enter the food chain and accumulate at increasing concentrations in living organisms. When the natural concentration of heavy metals increases, it accumulates in living organisms and exerts toxic effects and affects human health negatively by passing through people through food chain. However, this data does not show the effect of pollutants on the biota in the aquatic environment. For these reasons, aquatic organisms have been used to determine water pollution in recent years. One of systems responsible for heavy-metals' detoxification is the antioxidant defense system. Antioxidant defense system is a system that prevents cell damage that may occur due to free radicals. This system has several elements for detoxifying but glutathione is the most effective enzyme in the detoxification of metal contamination.

In the light of this information, malondialdehyde (MDA) levels resulting from lipid peroxidation and the activities of antioxidative enzymes such as glutathione (GSH) and total antioxidant status (TAS) in some tissues of fish species commonly found in Obruk Dam Lake are determined and evaluated. This work was done seasonally for a year. MDA, GSH and TAS levels were measured spectrophotometrically by using appropriate methods.

In conclusion, antioxidant biomarkers were found to be higher in the liver and gills. According to this situation it was observed that physiological events that occur in related tissues to provide oxidative equilibrium contribute to stabilization of water ecosystem.

Keywords: Obruk Dam Lake; TBARS, Glutathione,

Total antioxidant status, Liver, Gill

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Poster No. 44

Melatonin decreases lens oxidative stress level by promoting glutathione peroxidase and reduced glutathione values in STZ-induced diabetic rats

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Cataract disease has been a worldwide health problem. Hyperglycemia plays an important role regarding the advancement and progression of diabetic cataract oxidative injuries by the expanded reactive oxygen species (ROS) generation. Melatonin has been assumed as a powerful antioxidant that detoxifies different types of ROS in numerous metabolic diseases. The present investigation was led to research whether melatonin administiration has a protective function against diabetic lens oxidative injuries through arrangement of decreased glutathione (GSH) and glutathione peroxidase (GPx) systems in streptozotocin (STZ)- induced diabetic rats.

Thirty two rats were grouped into four in same numbers as control, STZ, melatonin and STZ and only melatonin. Intraperitoneal 10 mg/kg melatonin was applied to the third and fourth groups for 2 weeks. For the purpose of causing diabetes in the second and fourth groups, intraperitoneal STZ (45 mg/kg) was applied. Lipid peroxidation (MDA), total oxidant status and intracellular ROS levels in the lens were increased in STZ group, although they were decreased by the melatonin treatment. GPx activity, GSH concentration and total antioxidant status (TAS) were found lower in STZ group compared to control. Besides, the GSH concentration, GPx activity and TAS levels were recovered by melatonin. In addition, TAS was also higher in the melatonin group than in the STZ and melatonin groups.

In conclusion, the present study shows that melatonin induced protective effects against diabetes induced lens oxidative injury through up-regulation of the GSH and GPx values but down-regulation of oxidative stress.

Keywords: Diabetes; Glutathione; Lens; Lipid peroxidation; Melatonin.

Poster No. 45

An independent risk factor for cardiovascular diseases in asthma: Homocysteine

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Asthma is one of the common chronic diseases and an important health problem for our country as it is in the World. In recent years, the pathogenesis of many diseases has increasingly been accused of free radical damage and inadequate antioxidant defense systems. Many risk factors play a role in the development of asthma. Homocysteine (Hcy) is a product of methionine metabolism and thought to play a role in the pathogenesis of asthma and other pulmonary diseases. On the other hand, cardiovascular disease is frequently a cause of morbidity encountered in asthma patients. The

most important evidence of this situation is the endothelial dysfunction in the pathogenesis of respiratory disease. Moreover, endothelial dysfunction is stimulated by increased Hcy.

Hence, we aimed to determine Hcy levels in individuals with asthma to predict the risk factors that could lead to the development of cardiovascular diseases.

Serum samples of 42 patients were used in the exacerbated period of asthma in our study. Control group was created with 25 healthy individuals. Measurement of Hcy levels was performed with HPLC.

While the homocysteine levels ranged from 7.22 to 12.39 μmol/l in the control group. Hcy levels of asthma patients were found to be between 10.01 and 30.7 μmol/l in asthma patients. Besides, Hcy levels in asthma was found statistically significantly higher than the control group data ($p<0.05$).

In conclusion, high Hcy promote atherosclerosis in damaged blood walls and cause undesired blood clotting. This may be a risk factor for asthma pathogenesis and subsequent cardiovascular disease.

Keywords: Homocysteine; Asthma, cardiovascular diseases; Oxidative stress.

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Poster No. 46

Malondialdehyde (MDA) as a marker of lipid peroxidation levels in chronic hepatitis B

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Chronic viral hepatitis agents such as hepatitis B and hepatitis C virus infection still maintains its first place among the etiologic causes of chronic liver disease all over the world. Due to its chronic, it sometimes causes hepatocytes damage in high doses. Free oxygen radicals also leading to defects in membrane structure and cellular functions damage proteins, nucleic acids and lipid peroxidation and lipid peroxidation, and they play a role in the pathogenesis of many diseases. Malondialdehyde (MDA) is regarded as a marker of the lipid damage indicator via free radicals and the increase in the amount is a significant damage indicator.

The aim of the study was to determine the level of MDA, a marker of lipid damage, in patients with chronic HBV.

Serum samples of 22 patients with chronic HBV and 22 healthy individuals as controls were used in our study. MDA levels in all groups were determined by HPLC using appropriate kits.

As result, MDA levels of patients with chronic HBV were found statistically significantly higher than healthy controls in the control group ($p < 0.05$).

In conclusion, nitric oxide (NO) pathway and end products are free oxygen radicals that play an active role in the regulation of hepatocyte function. For this reason, viral agents such as HBV and HCV which increase damage in the liver increase the oxidative stress load more and more.

Keywords: Malondialdehyde; Hepatitis B; Oxidative stress.

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Poster No. 47

Analgesic actions of borneol: Evidence for specific actions

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Search for plant medicines is very old and still an important source for new lead drugs (Harvey et al., 2015). Volatile oils of medicinal plants are traditionally used since antiquity for diseases including pain but their effects on TRP cation channels as a mechanism of action is has not been clarified yet. Borneol is one of the naturally occurring volatile compounds of medicinal plants ethnomedically used against pain at the East Mediterranean countries (Aydin et al. 1996). The involvement of TRP cation channels as the mechanism of action of borneol was reported recently (Wang et al. 2017). The aim of this study was to investigate the analgesic actions of (+)-borneol in mice.

(+)-Borneol was commercially obtained and it was diluted in DMSO (100 mg/kg). Mechanical and thermal algesic stimuli were used in experiments. Application of a bulldog clamp on the tail of albino mice of both sex was used for mechanical algesic stimulus and 52^{o}C water for thermal algesia. Cutoff time was 15 sec and the following formula was used to calculate percent analgesia. R programming packages were used for statistical evaluation and plotting.

% analgesia=(post drug latency – prodrug latency) /(cutoff time – prodrug latency)*100

Analgesic action of borneol was observed against mechanical algesia but not against thermal algesic stimulus.

In conclusion, borneol is a bicyclic oxygenated small compound substituted with dimethyl and hydroxyl groups with actions on TRPM8. The effects on mechanical but not thermal algesia suggest the presence of interactions between borneol and TRP channels and the interactions should be discovered by future studies.

Keywords: Borneol, TRPM8 channel, analgesia

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Poster No. 48

A specific GG4 motif for the TRPV1 and TRPV3 ion channels: GFYFGE

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Medicines used for against diseases interact with endogenous proteins enzymes, ion channels or receptors. Ligand-receptor binding is required but protein-protein interactions are very important. Short linear motifs of receptors, ion channels and enzymes in protein structure are an important concept. The role of GG4 motifs (GXXXG) are shown on many protein functions (Mueller et al. 2014). The aim of this study was to investigate the presence and location of GG4 motifs on TRPV1 ion channels.

The protein sequences were downloaded from uniprot database (www.uniprot.org). TRPV ion channel sequences were extracted using Slackware GNU/Linux operating system. R/Bioconductor packages, Protr and Bio3d and ClustalW were used for alignment of proteins, statistical evaluation and plotting. Swiss-model, Swiss Pdb-viewer was used for 3D modeling and viewing.

The results of our investigations showed the presence of GFYFGE motif unique for the ion channels

found only on TRPV1 and TRPV3 of all species equenced as of the date of investigation. The difference between location of the discovered motif on TRPV1 and TRPV3 channels are only 13 amino acid shift. Since the role of this motif on ligand-TRP channel is very difficult by wet lab experiments (Mueller et al. 2014), our in silico results suggest a possible similar binding site for the TRPV1 and TRP3 indicating a possible similar ligand reservoir. Based on this finding, ligands of TRPV3 like carvacrol, found in nature are also expected to be a ligand for TRPV1 but not for TRPA1.

Keywords: Bioinformatics, TRPV1, TRPV3, motif, GG4, carvacrol.

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Poster No. 49

Preeclampsia is associated with polymorphism of transient receptor melastatin 3 gene, but not transient receptor melastatin 4 gene

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Preeclampsia a multisystem, highly variable disorder unique to pregnancy leads to maternal and fetal/neonatal morbidity and mortality (Backes et al., 2011). It is currently unclear precisely which factors are involved in the pathogenesis of preeclampsia. Several alterations in maternal Ca^{2+} homeostasis have been identified in cases of preeclampsia. Transient receptor potential (TRP) channels are non-selective channels permeable to monovalent and divalent cations (Yang et al., 2013). Thus, changes in the function or expression of TRP channels could alter intracellular Ca^{2+} levels. The aim of this study was to investigate a possible association between TRPM3 and TRPM4 gene polymorphisms and preeclampsia.

A total of 96 patients with preeclampsia and 95 healthy controls with similar age and sex included to the study. For polymorphism studies, genomic DNA from the participants was analyzed by a BioMark 96.96 dynamic array system.

There were significant associations between TRPM3 gene rs1328142, rs75455424, rs7021834 and rs148780873 (Pro635Ser) polymorphisms with preeclampsia. However, no associations were found between TRPM3 rs4744608 polymorphism with preeclampsia . GG and GT genotypes and G allele frequencies in rs1328142, GG and CG genotypes and G allele frequencies in rs75455424, GG genotypes and G allele frequencies in rs148780873 polymorphism were markedly low in patients. Although CC genotypes and C allele frequencies in rs7021834 polymorphism were markedly high in patients. No associations were found between TRPM4 gene rs61732831, rs113984787 (Ala101Thr), rs147267761 and rs3745301 polymorphisms with preeclampsia.

In conclusion, our results are the first to demonstrate that TRPM3 gene polymorphisms may modify individual susceptibility to preterm birth in the Turkish population.

Key words: polymorphism, preeclampsia, TRPM3.

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Poster No. 50

Effect of leptin on insulin secretion through ATP sensitive potassium channels at Type-1 diabetes

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Diabetes is a metabolic disease that brings about various complications including cardiovascular and circulatory disorder, cancer, and similar diseases and affects human life negatively. Diabetes is a disease that has two big sub-categories as type 1 and type 2. Pancreatic β-cell loss by apoptosis at type 1 diabetes is an important mechanism in the decrease of insulin hormone. Like insulin, leptin is also one of the antiapoptotic and proliferative hormones. Moreover, it is known that low leptin and insulin treatment is more effective in tamponing blood glucose than only high dose insulin use. However, these boosting of leptin on decline of blood glucose at diabetes has been still a mystery. The aim of study was to investigate that leptin can increase insulin secretion at pancreatic β-cell through ATP-sensitive potassium channel (KATP).

Human pancreatic beta cell line (1.1B4) was used to create groups as control, diabetes, leptin and co-treatment leptin plus diabetes. Insulin secretion, apoptotic markers, oxidative stress index (OSI) and F-actin distribution were analyzed.

Diabetes caused apoptotic cell lost leading elevation of OSI and F-actin destruction, eventually decline of insulin secretion. However, co-treatment of leptin plus diabetes caused to decrease OSI, apoptosis through KATP, elevation of insulin secretion.

In conclusion, leptin treatment could help to regulate blood glucose level in diabetes.

Keywords: Actin; Apoptosis; ATP sensitive potassium channels; Diabetes; Insulin; Leptin Oxidative stress.

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Poster No. 51

Is there any relationship between TRPV5 and TRPV6 gene variants and colorectal cancer risk?

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Colorectal cancer (CRC) is the third most frequent cancer in both sexes. The development of CRC depends on genetic and environmental factors. Ion channels establish a transient membrane potential, and allow ions (e.g. sodium, calcium, potassium) to pass through the channel pore. Although it has been reported that Transient Receptor Potential (TRP) channels, as an ion channel, have been identified in many physiological processes, the relationship between these channels and

cancer progression is not yet clear. The aim of the present study was to investigate the distribution of TRPV5 and TRPV6 genetic variants and clinicopathological properties in patients with CRC.

This study enrolled 39 patients with CRC and 37 healthy controls. The TRPV5 and TRPV6 genotypes were determined by using Sanger Sequencing method. There are no significant differences between TRPV5 rs4252372 and TRPV6 rs4987667 genetic variations and gender, age, T-stage, tumor location or lymph node involvement.

In conclusion, neither TRPV5 nor TRPV6 gene variations are a prognostic factor, and further investigations with large samples are necessary to understand the role of TRPV5 and TRPV6 channels on the molecular mechanisms of cancer. Although there is no statistically significant results, TRPV5 and TRPV6 genotypes which include mutant alleles are thought to be related with colorectal cancer risk.

Keywords: Colorectal cancer; TRP channels; TRPV5; TRPV6; Sanger sequencing.

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Poster No. 52

Protection of melatonin on beta cell toxicity induced by doxorubicin though MAPK/ NF-κB signaling

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Doxorubicin (DOX) has been reported to lead to having a toxic effect on many tissues including heart, pancreas, liver, kidney and testis. The mechanism of its toxicity is not yet understood. Its toxicity effects are suggested some with reactive oxygen species, depolarization of mitochondrial membrane potential (MMP) and loosing of energy production of mitochondria. There are limited studies available about its toxicity of DOX on pancreas tissue. Also; there are few studies mention that acute pancreatitis (AP), one of inflammatory illness, is induced by DOX's adverse effects. Melatonin (MEL) is one of hormone secreted from many tissues. MEL has many effects such as circadian rhythm, anti-inflammation and anticancer. AP-induced by DOX is still unclear whether it could heal or not.

Human pancreatic beta cell line was used. Protein expression, mitochondrial membrane potential (MMP), active-caspase 8, actin and oxidative stress index (OSI) were analyzed in in four groups of β-cell as control, melatonin, doxorubicin, and a combination of melatonin and doxorubicin. Results: DOX cause to depolarize MMP, resulting in enhancing apoptosis by activation of caspase-8 through DOX through MAPK/NF-κB pathway. Also, DOX destroyed actin distribution by elevation of OSI. However, co-treatment of MEL and DOX could reverse depolarization of MMP and initiation of apoptosis by decline of DOX through MAPK/ NF-κB signaling.

In conclusion, MEL can prevent pancreatic toxicity-induced by DOX through MAPK/ NF-κB pathway.

Keywords: Doxorubicin; Oxidative stress; Pancreas; Protein kinase; NF-κB; Melatonin.

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Poster No. 53

Oxidative stress index in Tuj sheep with pneumonia

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Pneumonia is one of the most common diseases that cause economic loss in sheep, as in other domestic animals (Aydın and Paracıkoğlu 2006). In this study, it was aimed to evaluate oxidative stress index in Tuj sheep clinically diagnosed with pneumonia.

A total of 54 sheep (2-3 year old) were used in the study. Thirty four of them were selected for study group, diagnosed with pneumonia, and 20 clinically healthy sheep for control. Blood samples were collected from vena jugularis and sera separated. Total antioxidant capacity (TAC) and Total oxidant capacity (TOC) concentrations were evaluated in serum samples. The oxidative stress index (OSI) was calculated using this data. After the analyses performed, in both TOC concentration and OSİ level, statistically significant increase was observed ($p<0.001$) and TAC concentration was significantly decreased in pneumonia group compared with healthy group ($p<0.001$).

As a result, oxidative stress index increased in sheep with pneumonia. The pneumonia that emerges in sheep is generally confused as a complex disease table (Davies 1985). Etiologically, it is often confused with mixed infections. Factors such as unsuitable breeders, inadequate animal breeding, sudden climate changes, nutritional requirements, grafting and stress are very influential in disease. In addition to adverse environmental conditions, other etiological factors (viruses, bacteria, etc.) present in the environment are also primary factors in disease (Hindson and Winter 2002, (Aydın and Paracıkoğlu 2006). This can be explained by the increase in the oxidative stress index, which is an indication of the oxidative balance of the oxidant side.

Keywords: Pneumonia, Tuj sheep, oxidant-antioxidant, oxidative stress index

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Poster No. 54

Transient receptor melastatin 3 gene rs148780873 (Pro635Ser) polymorphism is associated with preterm birth

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Preterm birth is commonly defined as any birth before 37 weeks completed weeks of gestation. Preterm

birth is the leading cause of neonatal death and infant mortality (Blencowe H. et al,2013). Transient Receptor Potential Melastatin-3 (TRPM3) is a calcium-permeable ion channel. TRPM3 was found to have functional relevance to proliferation and contraction of smooth muscle cells. The aim of this study was to investigate a possible association between TRPM3 gene polymorphisms and preterm birth in a Turkish population.

A total of 90 women in preterm labor and 96 women in term labor with similar age and sex were enrolled to this study. Genomic DNA from the participants was analyzed by a BioMark 96.96 dynamic array system.

There was a significant difference in the genotype (GG, 97.6%; GA, 1.2%; AA, 1.2%) frequencies for the TRPM3 rs148780873 (Pro635Ser) polymorphism in preterm birth compared to controls (GG, 88.5%; GA, 11.5%; AA,0%, p=0.0122). However, no association was found with the TRPM3 rs1328142, rs75455424, rs4744608 and rs7021834 polymorphisms

These results are the first to demonstrate that TRPM3 gene polymorphisms may modify individual susceptibility to preterm birth in the Turkish population.

Key words: Polymorphism; Preterm birth; TRPM3.

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Poster No. 55

Protective role of meteoroid-like peptide and exercise in cardiac ischemia reperfusion injury

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Myocardial infarction (MI) is a heart disease with a high mortality and morbidity rate. Disturbances in mitochondrial function in heart diseases lead to an increase in ROS levels (Chistiakov et al., 2017). Exercise reduces cardiac ROS production in the mitochondria of the heart (Starnes 2007). Meteorin-like peptide (Metrnl) synthesized from muscle tissue is known to be associated with exercise. The aim of our study was to investigate the relationships between Metrnl, exercise and mitochondrial biogenesis (MB) in ischemia-reperfusion (I\R) injury.

Metrnl levels in human control (n=200) and MI serum samples (n = 200) were assessed using ELISA assay. Wistar albino rats were divided into six groups as control, I\R, exercise (E), I\R + E, I\R + Metrn1 and I\R+E + Metrn1 as six animals in each group. A 6-week treadmill running exercise was performed for the exercise groups. Expression levels of Metrn1 and MB related genes in heart and muscle tissues were evaluated by qRT-PCR. The effect of Metrnl on vascular contractions was determined by an isolated organ bath experiment.

Current study was determined that human serum Metrn1 levels did not change in MI patients compared to the control. According to the control group in rats, heart Metrnl expression decreased significantly in the IR group. Metrn1 levels were normalized the decrease in all exercise groups by the exercise. Metrn1 peptide levels in muscle tissue were significantly increased in the exercise compared to control, but there was no significant change in IR groups. It was determined that MB-related gene expressions were significantly altered in heart and muscle in all groups than control. Metrnl

was significantly increased the vascular contractions in an isolated organ bath experiment.

In conclusion, present study was observed that the protective feature of the exercise in I/R was related to MB. It was found that Metrn1 decreased in IR damage and that the exercise normalized this decrease. In particular, Metrnl was found to have protective properties in IR by increasing Tfam levels in muscle and heart tissues.

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Poster No. 56

Morphologic analysis in the buccal epithelial cells of in Type 2 diabetes patients

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Diabetes mellitus is a common endocrine-metabolic disorder. It causes hyperglycemia, associated with disturbances in the metabolism of carbohydrate, fat, and proteins, as a result of absolute or relative insulin deficiency. The main purpose of this study was to evaluate the cellular alterations in oral epithelial cells in type 2 diabetic patients. We performed light microscopic analysis of the buccal smears in thirty type 2 diabetics and thirty healthy individuals. The oral smears were stained using Papanicolaou method for morphologic analysis by light microscopy (Olympus BX-51). Cells with cytoplasmic polymorphism and perinuclear halo were counted in each slides. There is no statistical interaction between these parameters and type 2 diabetes ($p > 0.05$) Exfoliative cytology can be used to evaluate cellular alterations of type 2 diabetes. It requires additional studies in this area with a greater sample size to compare the described cellular changes to similar cellular changes caused by other diseases.

Key Words: Diabetes mellitus, Type 2 diabetes, Papanicolaou stain

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Poster No. 57

Micronucleus frequency in Human papillomavirus high risk types infected cervical epithelial cells using liquid based cytology

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Human Papillomavirus Virus (HPV) is the main causal factor of cervical carcinoma. The aim of this study was to evaluate the frequency of micronucleated cells in exfoliated epithelial cells with High Risk HPV types (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68). In this retrospective study, 74 cervical smears prepared via liquid based system obtained at the Bulent Ecevit University Department of Pathology were used. Forty

HR-HPV types infected smears were taken as study group, thirty-four smears with no infection agent were taken as a control group. Each slide was assessed using binocular Olympus BX 51 microscopy in oil immersion magnification for micronucleated cell analysis. These cells were counted on 1,000 intact epithelial cells. Statistical analysis was performed with SPSS 19.0 software (SPSS Inc., Chicago, IL, USA) Micronucleus was compared with the Mann-Whitney U test for two groups. P value of less than 0.05 was considered statistically significant for all tests. The frequency of micronucleated cells in HR-HPV types infected patients was higher than the value in the control group but the difference between the groups was not statistically significant ($p>0.05$).

Light microscopic evaluation could be used to screen the frequency of micronucleated cell in exfoliated epithelial cell prepared via liquid based cytology. The presence of micronucleus may reflect genotoxic impairments in the cervical epithelium in HR-HPV. Further studies are needed to investigate the potential role of HR-HPV on the formation of micronucleus and oxidative stress.

Keywords: Human papillomavirus, HPV, micronucleus, liquid based cytology

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Poster No. 58

The effect of alpha-lipoic acid on transient receptor potential melastatin (TRPM) 2, 8 ion channels in varicocele model rats

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Varicocele is one of the most important causes of male infertility causing dilation of testicular veins by testicular hypoxia and accumulation of reactive oxygen species, elevation of testicular temperature, and apoptosis1. Alpha lipoic acid (ALA) is one of the powerful antioxidants that protect the intrinsic cellular antioxidant defense system. Also ALA has strong antioxidant and anti-inflammatory effect2. Although varicocele is a pathology that can ameliorate surgical intervention, there is no known pharmacologic treatment yet. In this study, we aimed to investigate the effects of ALA on TRPM ion channels and to determine probable therapeutics potential of ALA for brightening the physiopathology of varicocele by performing varicocele surgery model in rats.

24 Wistar Albino adult male rats were divided into 3 groups. Group I: Sham (S, n = 8); Group II: Varicocele (V, n = 8); Group III: Varicocele + ALA (V + ALA, n = 8). In group S, abdomen was turned off without performing varicocele surgery model. Experimental varicocele surgery model was performed in V group. ALA was given by oral gavage as a dose of 100 mg/kg/ day for 8 weeks after performing experimental varicocele model in V+ALA group. At the end of study rats were sacrified and blood samples, testicular tissues were taken for biochemical (transforming growth factor beta (TGF-β) total oxidant level (TOS) and total antioxidant level (TAS)) and molecular analyzes (the gene expression levels of TRPM 2,8).

In group V, TOS and oxidative stress index (OSI) significantly increased while TAS significantly decreased compared to the other groups (respectively; $p<0.05$, $p<0.001$, respectively). In the V + ALA group, TOS and OSI significantly decreased while TAS

significantly increased compared to the V group ($p < 0.05$, $p < 0.001$, respectively). There was a significant decrease of TGF-β in V group compared to S group ($p<0.01$). But TGF-β levels increased in the V + ALA group compared to V group ($p<0.01$). In comparison of with the other groups, the level of TRPM 2 gene expression significantly increased while the level of TRPM8 gene expression decreased in group V (respectively; $p=0.001$, $p<0.001$). But in the V + ALA group, the level of TRPM 2 gene expression significantly decreased while the level of TRPM8 gene expression increased compared to V group (respectively; $p=0.025$, $p=0.043$).

Although current treatment of varicocele is only surgical intervention, this study will contribute to the future studies with the approach to varicocele pathophysiology as a model. In addition varicocele results in oxidative stress induced infertility. We believe that ALA with antioxidant effect may be effective in the treatment of varicocele, considering that changes in TRPM 2,8 expression levels especially by inhibiting, intracellular Ca^{+2} entry.

Keywords: Varicocele; Alfa lipoic acid; TRPM 2,8.

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Poster No. 59

Investigation of the effect of vitamin D in experimental varicocele model in rats

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Varicocele is one of the most common causes of male infertility. Also varicocele can be restored notably with surgical intervention. Although varicocele physiopathology has not been fully elucidated, several experimental studies have been performed to understand this physiopathology. Therefore, in this study we aimed to investigate the role of vitamin D on TRPM 2,8 ion channels on experimental varicocele model in rats.

In this research, 30 male Wistar Albino rats were divided into 3 groups (for each n=10). The first group sham; experimental animals were opened only in abdomen and closed without performing varicocele model surgery. The second group varicocele; experimental varicocele model surgery was performed. The third group, the treatment group; 500 I.U/kg/day Vitamin D (D vit.) was given intramuscularly for 4 weeks after performing experimental varicocele model surgery. At the end of the experiments, testicle tissues were taken for determining gene expression levels of TRPM 2 and 8 ion channels. The data were analyzed by ANOVA or Kruskal-Wallis test. Statistical significance was considered to be $p<0.05$.

The statistical analysis showed that gene expression levels of TRPM 2 and 8 were significantly increased in varicocele group compared to sham group ($p<0.05$). There was an insignificant decrease in TRPM 2 and 8 gene expression levels of treatment group compared to varicocele group.

In conclusion, TRPM 2 and 8 gene levels of varicocele group increased significantly compared to sham group, however D vitamin treatment could not reverse this increase. We think that the relationship between the TRPM family and D vitamin should be studied extensively in future studies.

Key words: Varicocele; vitamin D; TRPM channels.

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Poster No. 60

Paclitaxel induces TRPM2 channel activation, oxidative stress and cell death in DBTRG glioblastoma cells

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Resistance to paclitaxel in the treatment of glioblastoma tumors is a major obstacle. Paclitaxel has been used on stimulation mechanisms of apoptosis and oxidative stress through activation of overload Ca^{2+} influx in the treatment of cancer, although role paclitaxel on molecular mechanisms in the glioblastoma cancer cells has not been clarified yet. TRPM2 channel is activated oxidative stress and its activation may overload Ca^{2+} entry and apoptosis by paclitaxel-induced excessive oxidative stress. The aim of this study was to evaluate if a paclitaxel can alter the effect TRPM2 channel activity in the DBTRG glioblastoma cell line.

DBTRG cells were divided into two groups as control and paclitaxel (0.05 mM). Paclitaxel induced increase of apoptosis, mitochondrial membrane depolarization, reactive oxygen species (ROS) production, caspase 3 and 9 levels through activating TRPM2 in the cells. The ADP-ribose-induced TRPM2 channel activation was higher in the paclitaxel group than in control group. In addition, The ADP-ribose-induced intracellular free Ca^{2+} concentration was decreased in the cells by the TRPM2 blocker, N-(p-amylcinnamoyl) anthranilic acid.

Apoptosis and oxidant effects of paclitaxel were increased by activation of TRPM2 channels. Stimulation of TRPM2 channel could be used as an effective strategy in the treatment of the glioblastoma cancer cells.

Keywords: Apoptosis; Glioblastoma tumor; Paclitaxel; TRPM2 channel.

Poster No. 61

Ginkgo biloba supplementation does not affect doxorubicin-induced cognitive impairment and oxidative stress in rats

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Doxorubicin is an anthracycline derivative antibiotic widely used in various cancer therapies such as leukemia. It has been shown that the deterioration of cognitive function can be observed particularly in patients after the chemotherapy. It is believed that the doxorubicin-induced toxicity can be due to the oxidative stress. Ginkgo biloba (GB) is known as a antioxidant and can reduce the hydrogen peroxide level in cerebellar neurons. The aim of this study was to examine whether or not GB had protective role on cognitive dysfunctions of Doxorubicin-treated rats.

The ethical approval was obtained from Ethics Committee of Experimental Medicine Research and Application Center, Selçuk University and 32 female rats were used for study. Rats were randomly divided into four groups; Control, GB, Doxorubicin and Doxorubicin-GB. GB was supplied to rats as 100 mg/kg orally for 21 days from the start of the study. On the 7. and 14. day of the study, 4 mg/kg doxorubicin (totally 8mg/kg) was applied to relevant groups. After 21 days, open field and elevated plus maze tests were applied to control the cognitive functions of rats. Brain samples

were taken to determine the oxidative stress factors in the end of the study.

It was determined that decreased locomotor activity and increased anxiety in doxorubicin group compared to the control group ($p<0,05$). There was no significant difference between Doxorubicin+Ginkgo biloba group and control as well as ginkgo groups ($p>0,05$). Although it was not statistically significant, MDA and PC levels tended to increase and SOD and AOA activities tended to decrease in the brain tissue of the doxorubicin-treated rats ($p>0,05$). However no significant changes was observed with GB supplementation in the Doxorubicin-treated rats ($p>0,05$). GPx activity significantly decreased with Dox-treated rats ($p<0,05$), however GB supplementation had no significant effect on GPx activity ($p>0,05$).

In conclusion, GB supplementation cannot improve the cognitive dysfunctions and oxidative stress in the Doxorubicin-treated rats.

Keywords: Ginkgo biloba; Doxorubicin; Oxidative stress.

Poster No. 62

Sonic hedgehog signal pathway has changed in testicular cancer

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Testicular cancer is the most common malignancy, especially in men aged 15-35 years. Testicular tumors are classified as germ cell (seminoma, embryonal carcinoma, yolk sac, chiocarcinoma, teratoma, mix), sex cord stromal cell (leydig, sertoli, granulosa, monoma-fibroma) and various (lymphoma, leukemia, sarcoma, leomyoma, neurofibroma) (Voyvoda et al. 2017). Although the etiology of testicular tumors is not fully understood, genetic alterations have been identified in patients with testicular cancer (Albers et al. 2008). Recent studies have shown that the sonic hedgehog (SHH) signaling pathway, which has mitogenic and morphogenic functions, plays an important role in male genital system development (Haraguchi et al.2001). However, there is insufficient information about the expression of pathway and pathway related genes. In the current study, we aimed to evaluate the expression of SHH, GLI1,2,3,4, SMO, PTCH1,2 and STK36 genes.

In our study, testicular tissue samples were obtained from 29 testicular cancer patients and 16 healthy individuals who applied to Firat University Hospital. According to histological types, samples were divided into 5 groups; control, seminoma, embryonal carcinoma, leomyoma and sex-cord stromal cell. The expression of GLI1,2,3,4, SMO, SHH, PTCH1,2 and STK36 genes was evaluated by qRT-PCR.

In conclusion, analysis revealed a significant increase in expression of the SHH gene in all groups compared to the control. The data obtained show that the SHH gene plays an important role in the pathophysiology of testicular cancer and strategies that target the gene can be used to treat the disease.

Key Words: Testicular cancer, Sonic Hedgehog, qRT-PCR,

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Poster No. 63

Effect of tourniquet usage on preoperative and postoperative oxidative stress parameters undergoing unilateral total knee arthroplasty patients

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Knee arthroplasty is a replacement surgery aimed at ending pain and reintroducing arthrosis function in the case of gonarthrosis, and when done with proper indications and correct technique, the results are quite successful (Li et al. 2016). After trauma of extremities in muscle and skeletal system, usage of tourniquet during surgery often causes ischemia. Oxidative damage also increases depending on the ischemia (Koca et al. 2010). The aim of our study was to investigate the effect of tourniquet usage on preoperative and postoperative (1^{th} and 24^{th} hours) oxidative stress parameters undergoing unilateral total knee arthroplasty (UTKA) patients.

Thirty-one patients who underwent UTKA with or without tourniquet in Selcuk University Faculty of Medicine Clinic of Orthopedics and Traumatology were included in the study. Serum TOS (Total Oxidant Status) and TAS (Total Antioxidant Status) levels were analyzed by Beckman Coulter AU5800 routine biochemistry autoanalyzer. Oxidative stress index (OSI) level was calculated with this formula TOS/(TAS*10). It was determined a reduction between TAS0-TAS1, TAS^0-TAS^{24} (without tourniquet), TAS^0-TAS^1, TAS^0-TAS^{24} (with tourniquet) periods (p=0.025; p=0.021; p=0.002; p=0.003 respectively). There were no significant differences in other periods and parameters, both two operation methods.

In many studies, ıt was reported that usage of tourniquet during surgery increases oxidative stress status depending on ischemia in knee arthroplasty. In our study, OSI levels were decreased in operated patients with tourniquet and without tourniquet, but these reductions were not significant both two operation methods.

Keywords: Knee arthroplasty, tourniquet usage, oxidative stress, TOS, TAS

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Poster No. 64

Antioxidant activities, Antimicrobial effects and Gas chromatography mass spectrometry (GC/MS) analysis of the Sesame (Sesamum indicum L.)

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Sesame (Sesamum indicum Linn) is also around 4000 years in the world and it is one of the oldest oil crops in agriculture. Because of the antioxidant compounds, the pharmaceutical and cosmetic found the usage area. Sesame production in Turkey is mostly in an area influenced by the Mediterranean climate.

The aim of our study, the effect antioxidant and antimicrobial of Sesame samples consumed.

Sesame samples were obtained from a commercial institution. Ethanol and water were used for extracts. The antioxidant activities (TAC) were determined with spectrophotometric method developed by Erel. Antimicrobial activity of Sesame at three solvents was tested against S.aureus ATCC25923 E.faecalis ATCC29212, P.aeruginosa ATCC27853 E.coli ATCC25922 and C.albicans ATCC10231 by disc diffusion method.

Ethanol and water extracts were found to have TAC. Moreover, water extract was higher than ethanol in TAC studies. Ethanol extract was more than chloroform. Antimicrobial activity was not determined for distilled water extracts. However, it has been found that it has antimicrobial activity in varying proportions on microorganisms of both ethanol and chloroform extracts. The inhibition effect on C.albicans of ethanol extracts was higher than the others but the inhibitory effect on E. faecalis was weak. C.albicans was the most sensitive microorganisms against chloroform extracts while E. coli was the most resistance microorganisms. Tropone or 2,4,6-cycloheptatrien-1-one were common components used for GC/MS analysis.

Sesamum indicum plant has antioxidant and antimicrobial activity and Tropone derivatives content of all extracts, further studies to determine of the antitumor effects emphasize the importance.

Keywords: Sesamum indicum L., antioxidant activities, antimicrobial activities, GS/MS

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Poster No. 65

Antioxidant and antimicrobial characteristics of Walnut (Juglans Regia L.)

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Medical and aromatic plants have been used for centuries to provide food, condiments, medicine and healing. Walnut (Juglans Regia L.) leaf is a widely used folk medicine. Walnut is an important food for economy and culture of Turkey. Like other nuts, walnuts have become an important part of the daily diet since the time of the barn of mankind thanks to its long-term storage ability. As a result of studies on plants, it has been shown that plants may have an antimicrobial effect on their extraction with different solvents.

In our study, it was aimed to investigate the antimicrobial and antioxidant activities of walnut leaf extracts's essential oils in Corum province and its vicinity.

The walnut leaf extracts were weighed and extracted with 200 ml of solvent in a Soxhlet apparatus. The extracts were extracted with ethanol at 60-80 °C and chloroform at 45-65 °C for 8 hours. Disc diffusion method was applied to antimicrobial activity on S.aureus ATCC25923, C.albicans ATCC10231, E.coli ATCC25922 and E.faecalis ATCC29212 strains. The Total Antioxidant Status (TAS) of the samples was determined spectrophotometrically by the method of Erel.

In ethanol extracts, the maximum inhibitory zone was determined against C.albicans (18.5±1.5mm) followed by E. faecalis (13.0±1.0mm), S.aureus

(10.0±0.5mm) and E.coli(4.5±1.5mm). In chloroform extracts, the maximum inhibitory zone was determined against C.albicans(16.05±0.5mm) followed by E.faecalis (10.0±1.5mm), S.aureus(8.0±1.0mm) and E.coli(2.5±1.0mm).

In conclusion, all microorganisms used in this study were found to have various degrees of zone. TAS level was found higher in ethanol extract than in chloroform extract.

Keywords: Walnut, Juglans Regia L., antimicrobial effect, antioxidant activities

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Poster No. 66

Evaluation of addiction status in students who attend the substance addiction seminar at Hakkari University

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Smoke, alcohol and drug addiction are still a widespread phenomenon, as proven by recent reports from the World Health Organization (Sensone et al. 2018). Additionally, addiction showed a 17-fold increase since 2009 in turkey by reports from the United Nations (EMCDDA 2013). In this study, we aimed to determine the status of using cigarettes, alcohol and other substances and to evaluate the awareness training in the seminar organized about drug addiction in Hakkari University.

Questionnaire forms have been given to each attendant. Personel information and substance abuse status and awareness training have been questioned. 74 of 76 questionnaire sheet (%97,4) accepted for study.

According to the demographic data of our survey study; smoking rates were 60% for males and 42.3% for females. It was determined that the average age of starting smoking was 15,3 for males and 16,1 for females. Alcohol use rates were found to be 20% for males and 8,4% for female students, the average age of starting alcohol using 17 and 19, respectively. It was seen that the use of other substances was 13,1% in males and higher than that of females (3.3%). It is observed that that this problem was an important problem to be addressed before training was 84.7%, but it rose to 91.5% after training. In addition, there was an increase in the idea of the development of projects aimed at raising awareness of the family and the society after the training.

In conclusion, our results showed that the tendency of smoking, alcohol and other substance use is higher in male than female. Smoking has contributed to the tendency to use other substances. It is clear that the awareness training to substance addiction has increased the individual's awareness of the importance of this topic.

Keywords: Drug addiction; Smoke; Alcohol; Survey

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Poster No. 67

Investigating of Piezo 1 and Piezo 2 ion channel expressions in human primary malignant mesothelioma

Ebru ÖNALAN[1], İlay BURAN[1], Ahmet TEKTEMUR[1], İlknur ÇALIK[2], Tuncay KULOĞLU[3], Nefsun DANIŞ[1], Bilgi ERBAY[1]

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Primary malignant mesothelioma (PMM) is a rare cancer type which derived from cells lining peritoneum and mesenchymal cells. Asbestos exposure in 70% of the patients is present. In recent studies, many different ion channel receptor was determined to be important in the cancer etiology and progression. Action and pressure-sensitive Piezo1/2 ion channels, expresse in peritoneum and mesenchymal cells, are cation-selective mechanosensitive channels. In our study, we aim to evaluate of the Piezo1/2 ion channel expression in PMM tissue comparing healty tissue and the effects of siRNA transfection on apoptotic, autophagic and metastatic gene expression in malignant mesothelioma cell line.

In our study, samples were obtained from 28 PMM cancer patients and 12 healthy individuals who applied to Firat University Medical Faculty Hospital. The expression of Piezo1/2 genes was evaluated by qRT-PCR and immunohistochemical. siRNA transfections were performed in the SPC212 mesothelioma cell lines for Piezo 1/2 genes. Apoptotic, autophagic and metastatic gene expression was detected using qRT-PCR.

In conclusion, qRT-PCR and immunohistochemical analysis not revealed a significant change in expression of the Piezo1/2 in PMM compared to the control. Silencing of Piezo1/2 were significantly changed apoptotic, autophagic and metastaic gene expression.

The data obtained from cell culture show that the Piezo1/2 genes plays an important role in the pathophysiology of PMM cancer and that broad target strategies can be used to treat the disease.

Keywords: Piezo 1 ion channels; Human primary malignant mesothelioma.

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Poster No. 68

Electrophysiological investigation of acid sensing ion channels (ASIC) in the cochlear nucleus stallate neurons

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Acid sensitive ion channels (ASICs) are voltage–independent, proton–gated channels and abundantly scattered in both central and peripheral nervous system. In this study, a hypothesis that whether ASICs could have specific roles in processing of hearing signals by affecting excitability of stallate cells in cochlear nucleus was discussed. Characteristics of currents through ASICs of stellate cells in cochlear nucleus of 14–17 day albino BALB/c mice were determined by patch–clamp technique. In voltage–clamp experiments, an inward current brought about after exposition to an acidic solution and half–maximal activation pH values (pH50) of stellate cells were 5.84 (n=42). Amiloride inhibited those currents dose–dependently ($p<0.05$). Half–maximal inhibition value (IC50) of amiloride was 32.5 ± 0.4 µM for stellate neurons (n=30). In current–clamp experiments, activation of ASICs with a lower pH caused depolarization and neuronal discharge (n=14). ASIC channels are likely to play a role in information processing and pathological processes in the central auditory system.

Key words: Acid sensitive ion channels (ASIC), Electrophysiology, Cochlear nucleus, Patch clamp technique

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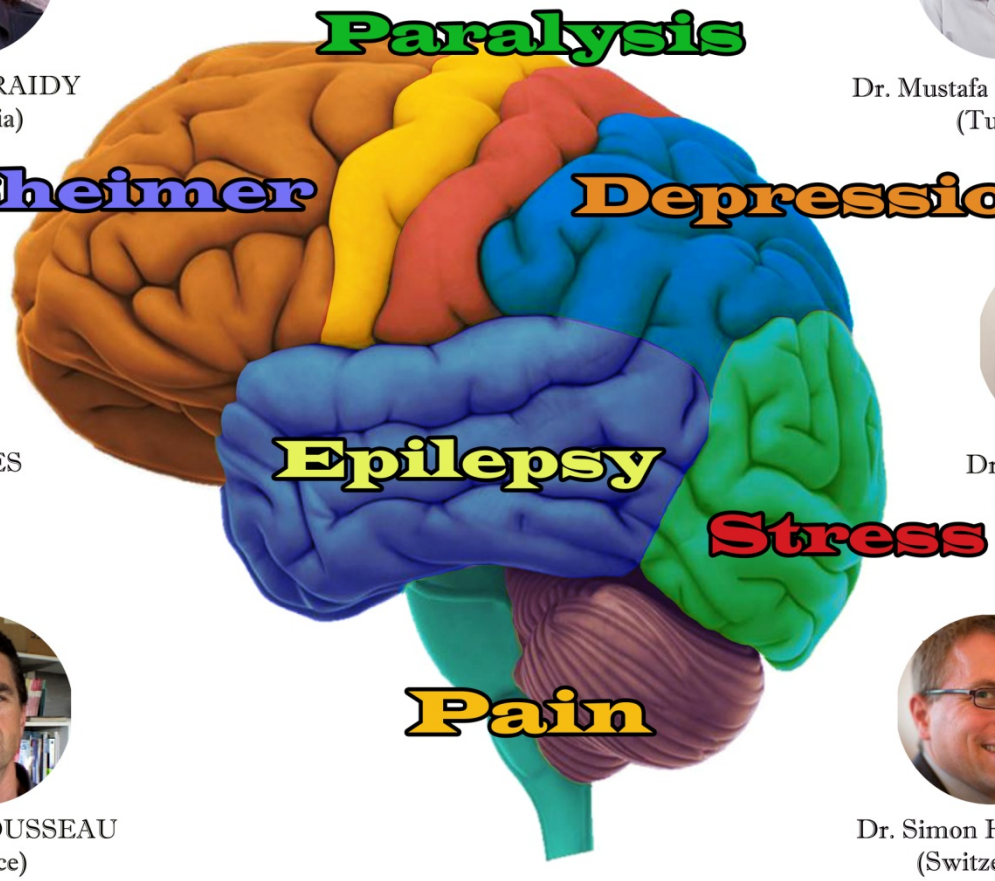

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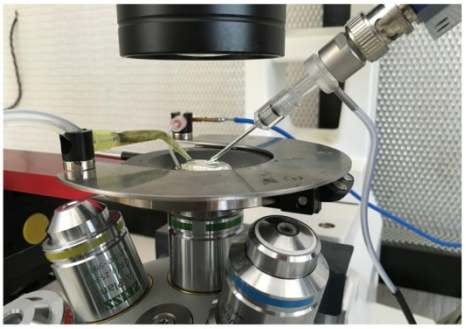

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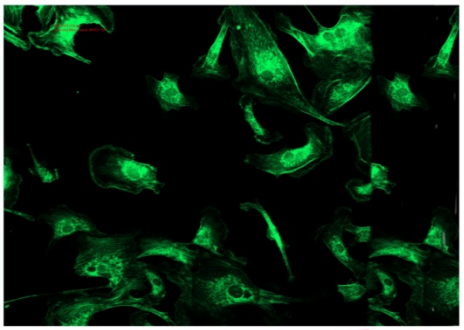

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