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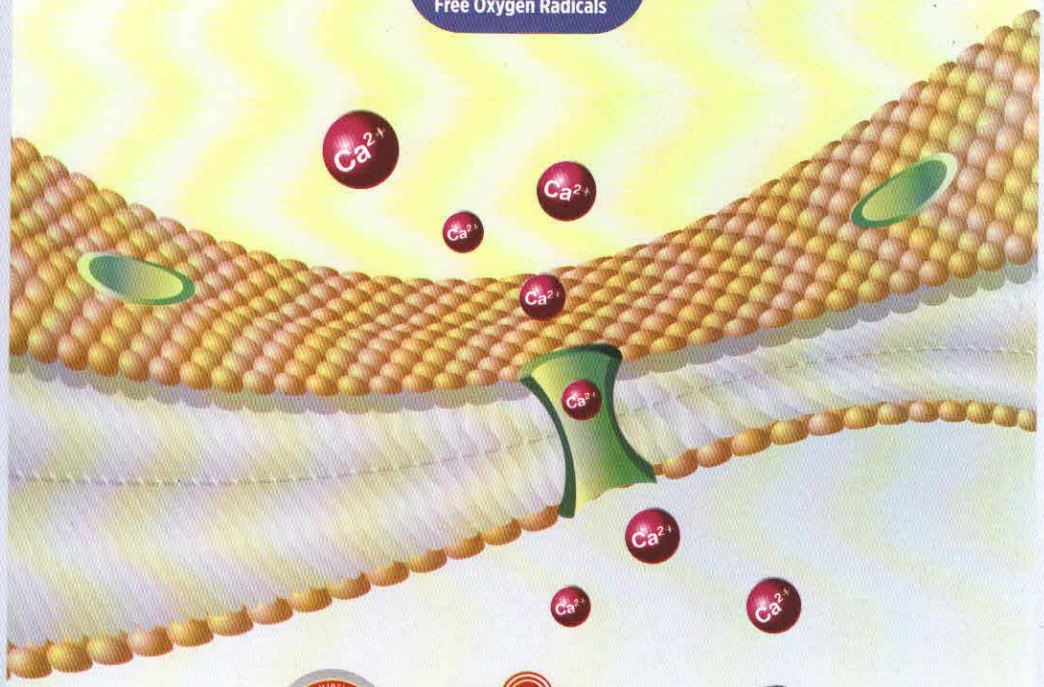

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Volume 4, Number 1, 2012

4th International Congress on Cell Membranes and Oxidative Stress: Focus on Calcium Signaling and TRP Channels

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AIM AND SCOPES

Cell Membranes and Free Radical Research is a print and 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 (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)

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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Keywords

Ion channels, cell biochemistry, biophysics, calcium signaling, cellular function, cellular physiology, metabolism, apoptosis, lipid peroxidation, nitric oxide synthase, ageing, antioxidants, neuropathy.

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Abstract Book

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Suleyman Demirel University Medical Faculty Department of Biophysics

cardiovascular system NO is able to regulate renal and cardiovascular homeostasis. In physiological condition NO is involved in adjustment of the cardiovascular system to the increased metabolic load. Insufficient amount of NO can lead to different diseases such as arterial hypertension, ischemic heart disease and atherosclerosis.

The aim of our research was to determine the level of the NO in the peripheral blood of the rats in case of the artificially induced renovascular hypertension.

Our research was made on 40 Wistar rats (males and females); weight 74-110g (the age of the rats - 1 month old). Ten rats served as a control. For solving this problem we created an experiment. We induced renovascular hypertension on all of the rats that were under experiment. The treatment started after three month of proved hypertension condition in rats. Pharmacological correction was used during 3 month. In the first experimental group we used angiotensin-converting enzyme inhibitors, in the second group - calcium channel blockers, in third - combined action of the above mentioned drugs. The level of the NO was determines according to the Griss method.

Concentration of the NO reached its maximum in the second experimental group. The minimal concentration of the NO was noticed in the first experimental group.

The results received proved that monotherapy (usage of the angiotensin-converting enzyme inhibitors only) is not effective in treating renovascular hypertension.

Poster No. 93

The effect of trehalose on oxidative stress parameters, DNA damage and some sperm parameters of Angora Buck frozen/thawed semen

Pürhan Barbaros Tuncer[1], Umut Taşdemir[1], Serhat Büyükleblebici[1], Taner Özgürtaş[2], Erdem Coşkun[3], Halil Erol[1], Fevzi Nuri Aydın[2], İsmail Safa Gürcan[4]

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Few studies have been done on the effects of trehalose supplementation in the cryopreservation of Angora buck semen. The objective was to determine the effects of different doses of trehalose in Tris extender supplemented on sperm motility, plasma membrane integrity, oxidative stress parameters and comet test after post freezing-thawing process. Ejaculates collected from 5 Angora goats were evaluated and pooled at 37°C. Semen samples, which were diluted with a Tris base extender containing the 6 different doses of trehalose (12.5, 25, 50, 75, 100 and 150 mM) and a base extender with no additives (control) for a total of 7 experimental groups, were cooled to 5°C and frozen at a programmed rate of 3°C /min from +4 to -10°C; 40°C/min from -10 to -100°C; 20°C/min from -100 to -140°C in a digital freezing machine. Frozen straws were thawed individually at 37°C for 30 s in a water bath for subjective and CASA motility and, HOS test evaluation. Biochemical assays were performed in a spectrophotometer and commercial kits were used. DNA damage analysis was performed by Comet Image Analysis (COMET III) programme. The freezing extender supplemented with 50 mM trehalose led to higher percentage of computer assisted semen analyzer (CASA) sperm motility (53.6±4.7%) when compared to the other groups and control ($P<0.05$). Moreover 25 and 50 mM trehalose treatment resulted in greater sperm subjective motility with an improvement over the control and other groups (61.9±3.40% and 61.9±4.11%, respectively, $P<0.001$). Additionally, 25 and 50 mM trehalose dose (56.1±2.6% and 53.9±1.89%, respectively) gave higher percentages of membrane integrity assessed by HOST than those of the other groups ($P<0.01$). The freezing extender supplemented with 50 mM, 100 mM and 150 mM trehalose led to higher GSH, LPO and CAT (mU/ml-10^9 cell/ml) values than other groups (108.1±11.1, 21.3±3.9 and 36.2±11.4, respectively). However, the cryoprotectans did not provide difference on the level of LPO, GPx, GSH, CAT and total antioxidant activities ($P>0.05$). DNA damage was measured for tail length (μm), tail intensity (%) and tail movement by COMET test, which were gave the lowest value for trehalose 50 mM (50.9±8.3, 8.6±1.7 and 2.8±0.7, respectively). While all groups of trehalose did not any significantly affect the DNA damage ($P>0.05$). Our results indicate that the optimum trehalose concentration had been determined to be 25, 50 and 75 mM in Angora goat semen. When the trehalose dose is increased, sperm motility and plasma membrane integritiy is decreased.

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Poster No. 94

The effects of carvedilol on isolated perfused rat kidney during cisplatin-induced nephrotoxicity

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Cisplatin is an important chemotherapeutic agent widely used in treatment of several cancers, with a severe nephrotoxic side effect. It has been known that different mechanisms such as oxidative stress play an important role in cisplatin induced nephrotoxicity .This study was performed to investigate the effect of carvedilol, an antihypertensive drug(β-adrenoceptor blocking agent) with antioxidative potential, on cisplatin-induced renal oxidative stress and nephrotoxicity in rats

Male wistar albino rats were divided into 3 groups (n=8):1-Control group 2-Cisplatin group (a single dose of cisplatin(5 mg/kg, i.p) 3- A single dose of cisplatin (5 mg/kg, i.p) + Carvedilol (2 mg/kg/day, i.p)for five days. . In all groups one of the kidneys was isolated and perfused with warmed (37 °C) and aerated (5% CO_2 in O_2) Krebs'-Henseleit solution . The other kidneys were separated and used for histopathological examinations and tissue malondialdehyde (MDA) measurements Serum urea and creatinine levels were determined . In group 2 perfusion pressures, serum urea, creatinine and tissue MDA levels were found significantly high ($p<0.001$)and widespread tubular necrosis and dilatation were observed versus other groups. In group 3, treatment with carvedilol significantly decreased ($p<0.05$) perfusion pressures, serum urea , creatinine and tissue MDA levels and diminished tubular dilatation and necrosis.

We concluded that carvedilol has protective effects against renal oxidative stress with altered renal haemodynamics during cisplatin nephrotoxicity.

Poster No. 95

Does ovariectomy have any impact on spatial memory performance in morris water maze?

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In this study, it was aimed to investigate whether ovariectomy has any impact on spatial memory performance in Morris water maze or not. 19 Wistar Albino rats were used. They were divided into two groups as control (n=12) and ovariectomy (n=7). Memory performance of the rats were evaluated employing long-term memory experiment in a Morris water maze apparatus. In the first four days of the experiment, the mean latency to reach platform was recorded as well as time spent in quadrants in one minute of the fifth day. In order to test the compliance of latency data to normal distribution, Shapiro-Wilk's test for normality was applied. On the other hand, the comparison of the control and ovariectomy groups in terms of daily latency data was carried out using Mann Whitney U test. Furthermore, the comparison of days regarding the latency data was performed with Repeated Measures ANOVA test and then, pairwise comparisons of this test were carried out with LSD test. In the control group, a significant difference was detected between the 1. day throw and the 3.-4. days' throws, regarding the latency to reach the platform ($p=0.001$). In the ovariectomy group, latency to reach platform was found significantly different upon comparison of the 1. day to all days in which the experiments were conducted (for ovariectomy groups: $p=0.007$, $p=0.027$, $p=0,0005$, respectively). No significant difference was found among different days when groups were compared with each others ($p>0,05$). In the throw of the fifth day, a significant difference was determined in both control and ovariectomy groups, regarding the time spent in quadrants ($p=0.003$, $p=0.001$, respectively). Based on the data, it can state that ovariectomy does not have any impact on latency to reach the platform in the first four days of throws and the time spent in the east quadrant following the throw of the rats into Morris water maze on the fifth day.