alteration can reflect the flexibility of the arterial tree to the different needs of supplied areas. Supported by VEGA 2/0048/17, APVV-15-0565.

D02-11
Quercetin supplementation moderates hypertension induced remodeling of coronary artery network

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Aims: Previously, we demonstrated beneficial acute and chronic effects of quercetin on coronary network properties and function. In this work, it was studied if chronic administration of quercetin could influence network remodeling of coronary vessels induced by experimental hypertension.

Methods: Male Wistar rats were divided into two groups. HQ group was treated with quercetin (30 mg/kg), while HC group was kept as parallel control. After 28 days, osmotic minipumps were implanted to infuse angiotensin II (200 ng/min/kg) for 28 days. At the end of treatment, animals were sacrificed, left descending coronary with its ramifications were prepared down to 80 µm and perfused. Using computerized videomicroscopy, network properties were analyzed offline.

Results: Quercetin treatment resulted in decreased blood pressure (161±7/122±6 vs. 137±10/110±10 mmHg, $p<0.05$). Segmental tortuosity of coronaries decreased in HQ group (1.3±0.19 vs. 0.4±0.06%, $p<0.01$), vessel wall slightly thickened over 200 µm inner diameter ($p<0.01$). Proximally, extremely widened (600-800 µm) artery segments appear in HC group, while distally more resistance size vessels were found (100-300 µm) in HQ group ($p<0.01$). Hemodinamically disadvantageous branching angles were less frequent in HQ group (24 vs. 16 % of total). Network tortuosity, an indicator of disorganization, decreased in HQ group (14±1 vs. 10±0.1%, $p<0.01$). Number of vascular anomalies decreased in HQ group (6.8±0.7 vs. 3.6 ±0.7 pcs, $p<0.01$).

Conclusion: Chronic quercetin treatment moderates angiotensin induced hypertension and disadvantageous remodeling of coronary artery network.

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D02-12
Exploring the murine microvascular response variability to hyperoxia with the wavelet transform

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Oxygen inhalation is widely used to dynamically assess microcirculation in vivo, and it is known to produce variable responses. Laser Doppler flowmetry (LDF) is a reference technique to quantify in vivo microcirculation, providing an oscillatory signal with several frequency components, whose components are still, however, poorly described in murine. Our aim was to describe the components of the murine cutaneous microcirculation using the wavelet transform (WT). 16 male C57/BL6 mice (18 ± 10 weeks old) were subjected to a 100% oxygen breathing protocol under ketamine-xylazine anesthesia, consisting in three phases – 10 min room atmosphere breathing, 10 min 100% oxygen breathing, and 10 min recovery. LDF signals were recorded on both hind paws. All procedures involving animal experimentation were ethically supervised. Two different vascular responses to

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hyperoxia were observed – perfusion decrease (PD) in 20/32 paws and perfusion increase (PI) in 12/32 paws. WT allowed the identification of several LDF frequency ranges, compatible with the cardiac (5.3-4.6 Hz), respiratory (3.8-3.2 Hz), myogenic (0.17-0.059 Hz), sympathetic (0.052-0.020 Hz), endothelial NO dependent (0.017-0.0094 Hz) and endothelial NO independent (0.0084-0.0042 Hz). The animals that responded with PD showed a significant increase in the cardiac and myogenic activities and a significant decrease in the NO-dependent activity. The animals that responded with PI showed a significant increase in the cardiac and myogenic activities, with no significant changes in the endothelial components. These results show the murine LDF frequency ranges, and also highlight the usefulness of the wavelet transform for the characterization of microvascular reactivity to hyperoxia.

D03: Molecular & cellular physiology

D03-1
The Role of Palmitoylation in Glutamate-Mediated Excitotoxicity in Neurodegenerative Diseases.

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Chronic neurodegenerative disorders such as Alzheimer's and Huntington's disease are associated with neuronal degeneration due to glutamate-mediated excitotoxicity as a result of dysfunctional proteins in the glutamatergic tripartite synapse. Palmitoylation controls several synaptic proteins in physiological glutamate neurotransmission but the role of palmitoylation in neurodegenerative diseases is unknown.

An integrated approach was taken to review the published literature and to make novel predictions to determine whether synaptic protein palmitoylation was disrupted and contributed to excitotoxicity in neurodegenerative diseases, with a focus on proteins already implicated in these disorders.

The major conclusion drawn is that disrupted palmitoylation to proteins throughout the tripartite synapse contributes to the mechanisms controlling excitotoxicity in Huntington's disease. The majority of synaptic proteins implicated in disease are predicted to be palmitoylated. Therefore, aberrant palmitoylation in each component of the tripartite synapse is predicted to affect homeostatic glutamate neurotransmission.

This research develops our understanding of the role of palmitoylation in neurodegenerative disease. Palmitoylation is disrupted in Huntington's disease which highlights a novel therapeutic target in the treatment of this disorder. But further research is necessary to establish whether aberrant palmitoylation is a common pathological mechanism in other life-limiting, neurodegenerative diseases.

D03-2
Cellular Calcium Balance in Chronic Kidney Disease

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Questions: Calcium cations (Ca^{2+}) are an important ubiquitous messenger, controlling a broad range of cellular processes. Disturbances in cellular calcium homeostasis in patients with chronic kidney disease (CKD) represent a complex process which aggravates with CKD progression. We aimed to

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investigate the state of cellular Ca^{2+}, Ca^{2+} entry via Ca^{2+}/cation channels and Ca^{2+} removal through plasma membrane Ca^{2+}-ATPases (PMCA) in the blood cells of CKD patients.

Methods: The study involved 22 healthy volunteers and 22 CKD stage 2-3 patients. Cytosolic Ca^{2+} measurements were performed by Fluo-3 fluorimetry. To examine the Ca^{2+} entry via calcium release activated calcium (CRAC) channels, an inhibitor of these channels, was applied. To determine the function of $P2X_7$ receptors, the antagonist and agonist of these receptors were used. The activity of PMCA was determined by UV-VIS spectrofotometry.

Results: Cytosolic Ca^{2+} concentration ($[Ca^{2+}]_i$) and Ca^{2+} concentration of intracellular stores of CKD patients was higher in comparison with healthy subjects. The Ca^{2+} entry via CRAC channels were increased in CKD patients. Activation of $P2X_7$ receptors caused an increase in $[Ca^{2+}]_i$ in both groups, but the effect was significantly smaller in CKD patients, likely by reason of higher $[Ca^{2+}]_i$ under basal conditions. Inhibition of $P2X_7$ receptors reduced $[Ca^{2+}]_i$ in CKD, but had no effect in healthy subjects. The activity of PMCA, was found to be decreased by 25 % when compared to healthy subjects.

Conclusions: Our results demonstrate that all these alterations inCa^{2+} signaling are contributing to the elevated $[Ca^{2+}]_i$ from early stages of CKD.

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D03-3

An Investigation into the Effects of Extracellular Acidification on Mouse Uterine Contractions; Are ASICs involved?

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Adequate uterine contraction is crucial to safe delivery of the foetus. Acidity can play an important role in affecting myometrial contraction but the effects, especially concerning external acidification, are unclear. This study was designed to determine the effects of acidic pHo on myometrium and any gestational differences, and to examine ASICs as possible mediators to the effects. Methods: Mouse uterus was used either on day 14 or 19 (term) of gestation. Changes in pHo to 6.9 were made for 10 minutes, by adding HCl to physiological saline. Spontaneous contractions were measured and data analysed. Statistical differences were tested with Student's t test and taken at P<0.05. Western Blotting was done following the protocol used previously in our lab. All assays. Mouse brain and urinary bladder were used as a control for ASICs expression. Results: At *14 days*, extracellular acidification to pH 6.9 significantly increased AUC, mainly due to an increased frequency and amplitude. At *19 days*, extracellular acidification to 6.9 also significantly increased AUC, frequency and amplitude (P value<0.05). Application of repetitive 10 min episodes of acidification (pHo 6.9) caused sequential increase in the amplitude of the force on term myometrium, but not in 14 days pregnant mouse. Western blotting showed ASICs 2a and 3 proteins were expressed in the mouse myometrium. Discussion: In mouse, a decrease of pHo stimulated pregnant uterine contraction. Extracellular acidification significantly increased the amplitude in term pregnant mouse more than mid-pregnant uterus which suggests a possible role of external acidification in labour. ASICs have been reported, and thus may contribute to increases in force via depolarization and increased Ca entry

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D03-4

The effects of the luteal cells cocultured with islet cells on cell viability and functionality in rats*

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Questions: It was aimed to evaluate the islet cell viability and functionality by coculturing the islet cells with luteal cells.

Methods: After isolation of luteal cells from the superovulated corpus luteum, they seeded to wells to attach the bottom of the wells and incubated for 24 hours. Islet cells were isolated at 24th hours of incubation of luteal cells. Then luteal cells and islet cells cultured separately or together by coculturing for 96 hours. Islets viability and glucose stimulation tests performed and stimulation index (SI) was calculated and total insulin secretion was determined in the islet medium and coculture medium at 48th and 96th hours.

Results: It was observed that islets viability increased significantly (p<0.05) at 48th h of the incubation in the cocultured group as compared to the only islet group. Islets viability was also increased at the 96th h in the cocultured group, but this increase did not found to be significantly. Islet functionality and insulin secretion were increased (P<0.05) in the cocultured group as compared to the only islet groups both 48th and 96th hours.

Conclusions: Although islet cells were incubated up to 48 h to transplant in routine procedure; in this study, viability and functionality of islet cells were maintained up to 96 hours, by coculturing with luteal cells and increased insulin secretion. These results suggest that the coculturing of islets cells with luteal cells may help the induction of insulin secretion after transplantation, by maintaining the viability and functionalities of the islets and it is extremely important for transplantation success.

Keywords: coculture, islet cell, luteal cell

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D03-5

Role and transcription profiles of α1 and β2 adrenergic receptors in tissues of yellow and silver European eels

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Adrenergic receptors (AR) belong to the wide family of G-protein coupled receptors (GPCR) and specifically bind catecholamines, i.e. epinephrine and norepinephrine. According to mammalian classification, there are two main groups of AR, α and β, with several subtypes: α1 (a Gq coupled receptor) and α2 (a Gi coupled receptor); β1, β2 and β3 (all coupled to Gs proteins). Pharmacological ligands were of limited help to demonstrate the presence and role of α and β subtypes in tissues from teleost fish, while further insights have recently been provided thanks to molecular approaches. In the present study, we evaluated the glucose output from isolated hepatocytes of yellow (feeding phase) and silver (sexually developing and migrating phase) European eels (*Anguilla anguilla*), treated with epinephrine. The hormone induced a time and dose-dependent glucose output, which appeared to be slightly different between yellow and silver eels. Major differences were instead observed in AR transcription profiles.The expression of α1 and β2 AR was evaluated by qPCR in different tissues of eels. Expression *α1-AR* mRNA was in the range of tens copies/ng RNA in liver, brain, gills and muscle of yellow eels, with values about 10-fold higher in the liver of silver eels. Expression of *β2-AR* mRNA in liver, brain, gills and muscle of yellow eels was in the range of hundreds of copies/ng RNA, with

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