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Poster 1:

Titel:Nrf2, a new player in tissue repair

Autoren: Al-Sawaf O.(1),Beckmann R.(1),Fragoulis A.(1),Schenkel J.(1),Alizai P.(1),Streetz K.(2),Pufe T.(1),Wruck C.(1),

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Abstract:
The transcription factor Nrf2 is known as the major regulator of cellular redox homeostasis through its ability to induce the expression of reactive oxygen species detoxifying enzymes. Therefore, Nrf2 plays an important role in the protection of virtually all tissues from insults. Beyond that, we show data characterizing Nrf2 as a novel key player in tissue repair. After muscle injury Nrf2 induced the expression of the myogenic factor MyoD in satellite cell and, thereby, facilitates satellite cell proliferation for muscle regeneration. In chondrocytes Nrf2 is able to up-regulate the expression of the pro-proliferative factor Sox9. Liver regeneration after partial hepatectomy was improved by Nrf2 via β-catenin induction in hepatocytes. In summary, we showed that Nrf2 ameliorated tissue repair by the induction of pro-proliferative transcription factors in regenerating tissue.

Kategorie: Poster

Poster 2:

Titel:Cases of anatomical varieties of the right coronary artery

Autoren: Apostolov A.(1),Krastev D.(2),Kalniev M.(3),Krastev N.(3),Mileva M.(4),

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Abstract:
Autopsy findings described by us represent congenital variety of coronary arteries. By definition, these varieties are found in less than 1% of the population. They are often found in combination with a congenital heart disease. In many cases, findings of coronary arteries of this type cause no symptoms and are detected incidentally during the coronary angiography and during the autopsy. In this study we present two cases of forensic autopsies of a 59 year-old man died after suicidal actions with electricity and a 79 year old man with a sudden death. Common for both presented cases is the autopsy finding of variety- blood supply to the heart muscle by two separate right coronary arteries. Autopsies of the dead men were held to a standard autopsy technique method Virchow, while method with dissection along the blood flow was not applied for heart sections. We applied a modified approach of the heart muscle dissections when the method of "open book" was used, namely - single dissection of the left atrium and left heart muscle ventricle and the subsequent dissection of the aorta. In our opinion the selection of the dissectional technique described allows in these particular cases better visualization and access to the coronary arteries of the heart, as well as gives a possibility for better photographic documentation. Cardiovascular pathology as congenital heart malformations have not been determined in the presented two forensic cases of varieties, manifested as two separate right coronary arteries, accidentally discovered during the autopsy. In the both cases, atypical blood supply to the heart found is not involved in the pathogenesis of the death of the individuals.

Kategorie: Poster

Poster 3:

Titel:Case of pulmonary atresia with multifocal pulmonary blood supply - anatomical and pathological discussion

Autoren: Apostolov A.(1),Vlahova A.(2),Chilingirova N.(3),Krastev D.(4),Kalniev M.(5),Krastev N.(5),Mileva M.(6),

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Abstract:
Congenital heart diseases (CHD) are the main heavy and socially significant problem of child pathology. Yearly in Bulgaria children with SCM 7.4 per 1,000 live births are born. In the group of cyanotic CHD children with tetralogy of Fallot (TF) have leading role. Malformations represent 10-11% of all CHD and occur from 0.26 to 0.8 / 1,000 live births, while in Bulgaria are 0.62 / 1000. We present the case of a forensic autopsy of the body of a female child aged 2 years and 4 months. The child was born after second unwanted pregnancy with a history of active form of syphilis of the mother and fetus. An adequate therapy was administered. According to the preliminary data the child was diagnosed with CHD - cyanotic heart disease by the type of severe TF, defined as inoperable condition in this case. In disssection of heart muscle, a large hole-13 mm with endocardial fibrosis around was found high in the septum between the chambers. Atresia of the right pulmonary artery ending blindly in the infundibulum part of the outgoing tract was discovered. After the outflow of subclavian artery there are two outgoing arteries for collateral blood flow to the lungs and one in the beginning of subclavian artery. Child's death was caused by circulatory disorders such as haemoconcentration in CHD. Against this background, the immediate cause of death of the child is the periventricular hemorrhagic infarct in the occipital portion of the right hemisphere with cerebral disseminated ischemic damage- praenecrotic changes in angiomatoid transformation of horoid plexus with focal hemorrhage in it.

Kategorie: Poster

Poster 4:

Titel:Changes in the extracellular matrix of varicose veins

Autoren: Arend A.(1),Lieberg J.(2),Aunapuu M.(1),

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Abstract:
Introduction. Although varicose veins have been studied for decades, there are still many unanswered questions regarding the mechanisms that could potentially lead to the dilatation of the vein wall. Alterations in the extracellular matrix composition may cause the weakness of the vein wall and cause the formation of varicose veins. Aim. The aim of this study was to determine the expression of different collagens, elastin and laminin in the wall of varicose veins of patients from different age groups. Methods. Patients (n=190) were divided into 3 groups: younger than 35 years (I), 36-50 years (II), older than 50 years (III). Control group consisted of 28 patients. Expressions of collagen I, II and IV, elastin and laminin were determined immunohistochemically and staining intensity was graded separately in intima, media and adventitia of the vein wall. Results. In the layers of varicose veins slight decline of collagen I and laminin was noted, while the amount of collagen IV was clearly reduced. Collagen II was found only in the adventitial layer and compared to the control group no differences were seen. The number of elastic fibers was found to decrease in the layers of varicose veins; in particular it was seen in groups II and III. In many patients presence of fragmented elastic membrane-like structures was noted. Conclusions. It can be assumed that changes in the balance of the extracellular structural framework of collagens, elastin and laminin may contribute to the weakening of the vein wall. Funding acknowledgement. This work was supported by project No. 0180012s11 with targeted financing from the Estonian Ministry of Education and Research.

Kategorie: Poster

Poster 5:

Titel: Localization of nitrergic structures in the carotid body in spontaneously hypertensive rats

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Abstract:
Background: The carotid body (CB) is a small, paired, neural crest-derived neuroendocrine organ that senses the oxygen level in blood and supervises ventilation. The spontaneously hypertensive rat (SHR) is a frequently used experimental model of essential hypertension and has been extensively used to study cardiovascular diseases. Postganglionic sympathetic neurons which innervate the CB via the ganglioglomerular nerves have their cell bodies in the superior cervical ganglion (SCG). Methods: The presence of nitric oxide (NO), a gaseous neurotransmitter substance, in a number of structures, was examined in the CB and SCG in the SHR using nicotinamide adenine dinucleotide phosphate diaphorase (NADPH-d) histochemistry, which distinguishes neuronal sites of NO production. Results: At the light microscopic level, we observed some glomus cells which were typically aggregated in clusters containing NOS-related NADPH-d reaction product. In addition, many nerve fibers penetrating the CB and enveloping the glomus cells and blood vessels were positive for the NO-synthesizing enzyme, nitric oxide synthase (NOS). The basic neurons in the rat SCG exhibited NADPH-d activity as well. They were arbitrarily distributed throughout the ganglion. The majority of them were small-to-medium in size and showed a moderate intensity of staining. The larger SCG neurons were also positive and displayed a stronger staining intensity. Conclusion: NO is a transmitter in the autonomic nerve endings supplying the CB and a good candidate to explain the sympathetic hyperactivity leading to hypertension. This work was supported by the European Social Fund and Republic of Bulgaria, Operational Programme “Development of Human Resources” 2007-2013, grant BG051PO001-3.3.060048.

Kategorie: Poster

Poster 6:

Titel:Apoptosis in varicose veins

Autoren: Aunapuu M.(1),Lieberg J.(2),Arend A.(1),

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Abstract:
Introduction. Chronic venous disease of legs is one of the most common conditions affecting people worldwide. One of the factors influencing vascular wall remodelling is cell apoptosis. The apoptosis of endothelial cells may promote the infiltration of inflammatory cells and lipids into the intima and increase smooth muscle cell migration and proliferation. Aim. The aim of this study was to detect apoptotic endothelial cells and smooth muscle cells in varicose veins wall of patients from different age groups. Methods. Patients (n=190) were divided into 3 groups: younger than 35 years (I), 36-50 years (II), older than 50 years (III). Control group consisted of 28 patients. Apoptosis was determined by the TUNEL method. Cell apoptosis was assessed by scoring the TUNEL-positive cells in intima, media and adventitia. Results. In most patients veins were stretched out with highly varying wall thickness. In media and adventitia smooth muscle cells were destroyed or showed altered morphology. In Group II and especially in Group III the percentage of apoptotic EC and SMC in the layers of varicose vein wall was increased compared to Group I and Control group. Conclusions. In conclusion, the study revealed that in varicose veins apoptosis of endothelial cells and smooth muscle cells increased with advancing age. If increase in apoptosis during earlier stages of varicosities is probably regulated by the intrinsic pathway, then in older patients other signalling pathways may be involved. Funding acknowledgement. This work was supported by project No. 0180012s11 with targeted financing from the Estonian Ministry of Education and Science.

Kategorie: Poster

Poster 7:

Titel:The hippo pathway component yap promotes early neural crest fate within the developing human neuroepithelium

Autoren: Azmitia L.(1),Hindley C.(1),Davis J.(1),Pruszak J.(1),

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Abstract:
The Hippo signaling pathway is an evolutionarily conserved master regulator of organ size and cell proliferation, which transmits cell density and polarity cues via inhibition of the activity of the transcriptional coactivator YAP. YAP has also been identified as an oncogene which promotes metastasis and epithelial-to-mesenchymal transition (EMT). The embryonic neural tube is an epithelial, highly polarized, neural stem cell (NSC) niche, where specification of the neural crest (NCR) occurs in a spatially organized manner. Delamination of the NCR from the dorsal neural tube constitutes a classic example of an EMT event occurring during normal development, and in vitro cell density is known to play a critical role in fate decisions undertaken by NSCs. We therefore considered YAP as a prime candidate for the regulation of fate decisions in NSCs. Although Hippo signaling is known to regulate the progenitor niche in several tissues in vivo, its role during mammalian neural development is still poorly characterized. Using NSCs derived from human embryonic cell lines, long-term expandable NSC lines derived from human induced pluripotent stem cells and the SH-SY5Y neuroblastoma cell line as model systems, we have characterized YAP activity during neural development. We note that downregulation of YAP accompanies neuronal differentiation, whilst increased YAP activity promotes a NCR fate. More specifically, we have observed a strong correlation between YAP activity and the early stages of NCR development, which we define using a novel cluster of differentiation (CD) surface marker code. Using siRNA to knockdown or activate YAP, we confirm that YAP regulates early NCR development in human NSCs in vitro.

Kategorie: Poster

Poster 8:

Titel:A recipe for an „all purpose“ perfusion fixation of rodent kidneys for morphology and cytochemistry

Autoren: Bachmann S.(1),Dittmayer C.(2),

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Abstract:
Current advances in rodent transgenic technology have increased the need for high resolution morphology and histochemistry protocols including suitable fixation recipes. Adequate preservation of the kidney requires particular care owing to the complexity of its parenchyma. Conventional in vivo vascular perfusion protocols may be complicated to perform and may require separate approaches for ultrastructural and histochemical investigation, resulting in large animal group sizes and related conflicts with animal welfare regulations. We aimed to establish a simple fixation protocol which permits global structural evaluation at high quality standards within a single experimental animal. Retrograde perfusion of the abdominal aorta was done using flushing buffer and aldehyde fixative. Parameters varied were the perfusion pressure, composition of the carrier and fixative solutions, post-fixation protocols and sample processing techniques including cryopreparation. Paraformaldehyde (PFA) fixatives were compared to standard glutaraldehyde fixation. Variations in carrier osmolalities were adapted. High-end quality was obtained using perfusion at 180 cm H2O, modified phosphate buffer as carrier solution, 4% PFA as fixative, followed by various post-fixation treatments adapted for cryo- and paraffin sectioning, conventional EM, freeze substitution or Tokuyasu technique, and immuno-EM. State-of-the-art confocal LM and EM techniques including tomography and STEM led to excellent results. In sum, a universal fixation protocol for rat and mouse kidney tissues has been developed, permitting global evaluation techniques within a single experimental animal, and for high standard glomerular, tubular and interstitial evaluation.

Kategorie: Poster

Poster 9:

Titel:Assessments on the types of abdominal aorta in relation with their traject

Autoren: Bardas A.(1),Bardas M.(1),Bordei P.(1),Ionescu C.(1),Dina C.(1),

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Abstract:
We studied 88 cases, of which 46 males and 42 females. Considering the traject, we describe 6 types: 1. in 4 cases (all males), the aorta described a curve concave to the left; 2. in 4 cases (all females), the aorta described a curve concave to the right; 3. in 10 cases (4 males and 6 females - 18.75% of female cases) the aorta describes two overlapping curves, both concave to the left, continuing one another directly or with an intermediate segment (vertical or oblique), making the appearance of the figure "3"; 4. in 10 cases (4 males and 6 females) the aorta described two superimposed curves, the superior one concave to the left and the inferior concave to the right; the two curves can be equal or unequal and making the aspect of an "S" in italics; 5. in 14 cases (8 males and 6 females) the aorta is rectilinear vertical, located on the front of vertebral column, on the midline; 6. in 32 cases (18 males and 14 females) the aorta showed an inferior oblique traject, with the obliquity oriented supero-inferior and from left to right.

Kategorie: Poster

Poster 10:

Titel:Impaired expression of nicotinic acetylcholine receptor subunits in diverticular disease

Autoren:Barrenschee M.(1),Wedel T.(1),Lange C.(1),Egberts J.(2),Becker T.(3),Böttner M.(1),

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Abstract:
Background: Diverticular disease (DD) is associated with intestinal innervation disorders (e.g. hypoganglionosis) and down-regulation of nerve growth factors such as Neuregulin-1 (NRG-1). Since NRG-1 acts as a regulator of nicotinic acetylcholine receptors (nAChR) expression, we tested the neurotrophic capacity of NRG-1 on cultured enteric neurons and analyzed the regulation of nAChR gene expression of nerve cells exposed to NRG-1. In patients with DD we further assessed the enteric nAChR mRNA expression. Material and Methods: Postnatal rat myenteric nerve cultures were stimulated with NRG-1 (2 or 10 ng/ml) for 6 days. Morphometric analysis was performed to evaluate the number of neuronal aggregates, neurite outgrowth and branching pattern. mRNA expression of nAChR subunits alpha3, alpha5, alpha7, beta2 and beta4 was determined by qPCR. Tunica muscularis samples of sigmoid colon from patients with DD and controls were assessed for mRNA expression of the nAChR subunits given above. Results: NRG-1 treatment of myenteric nerve cultures significantly increased the number of neuronal aggregates, neurite growth, branching pattern and expression of nAChR subunit beta4. In the tunica muscularis of patients with DD, mRNA expression of subunit beta4 was significantly decreased compared to controls. Conclusions: NRG-1 promotes the growth of postnatal enteric neurons and contributes to the gene regulation of nAChR subunits. Decreased mRNA expression of nAChR subunit beta4 in patients with DD further supports the hypothesis that a lack of neurotrophic factors affects the composition of neurotransmitter receptor subunits involved in intestinal motility thus contributing to the intestinal motility dysfunction previously reported in DD.

Kategorie: Poster

Poster 11:

Titel:Effect of hspb5/alphab-crystallin phosphorylation on the dendritic branching of cultured rat hippocampal neurons

Autoren:Bartelt-Kirbach B.(1),Moron M.(1),Weller M.(1),Golenhofen N.(1),

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Abstract:
Neurons are postmitotic cells especially susceptible to pathophysiological conditions. The complexitiy of their dendritic tree is reduced under many stress conditions and also some neurodegenerative disorders as Alzheimer's disease. Exposure to stress conditions leads to the induction of the cellular stress response, as part of which the small heat shock proteins (sHsps) are upregulated. These proteins act as chaperones but can also exert specific functions (e.g. anti-apoptotic). We could show previously that the sHsp HspB5/alphaB-crystallin is expressed in rat hippocampal neurons and that the phosphorylation of this protein at three sites (serine 19, 45 and 59) leads to a different subcellular localization in neuronal processes as dendrites, axons and spines. Overexpression of wildtype HspB5/alphaB-crystallin in these cells resulted in an increased complexity of the dendritic tree while knockdown with an HspB5/alphaB-crystallin shRNA markedly reduced it. We were now interested in the influence of HspB5/alphaB-crystallin phosphorylation on dendritic branching. To this end, we constructed HspB5/alphaB-crystallin phosphomimics with mutations of serine to glutamine (mimic of phosphorylation) or alanine (non-phosphorylatable) in a lentiviral expression vector. Overexpression of these phosphomimics in cultured rat hippocampal neurons revealed that the increase in dendritic branching is indeed dependent on phosphorylation. This might point to an important function of the phosphorylated HspB5/alphaB-crystallin in the protection of the dendritic tree under pathological conditions.

Kategorie: Poster

Poster 12:

Titel:Vascular adventitia- and epicardium-resident stem cells in myocardial infarction

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Abstract:
A significant challenge in cardiovascular medicine is the identification of stem cells that contribute to new heart tissue after myocardial infarction (MI). The vascular adventitia (VA) and the epicardium (Epi) are sources for vascular and mesenchymal stem cells. So far, less is known about the role of these structures in early post-MI processes. In this study, the expression of stem cell and inflammatory markers after MI were investigated to argue the role of the VA and Epi as immediate and local stem and immune cell reservoirs. In a murine model of acute MI, the expression of stem cell as well as inflammatory markers such as CD34, CD44, c-Kit, iNOS and IL-10 were studied in single and double immunostainings in VA and Epi. The expression of CD34 was significantly reduced in VA post-MI, accompanied by an increased expression in Epi of the ischemic and remote zone. The number of Ki67/CD44 and c-Kit positive cells was increased in VA as well as in Epi 2 h post-MI. Furthermore, adventitial and epicardial CD44 positive cells were partially double positive for the inflammatory proteins iNOS and IL-10, respectively. Our studies show for the first time an immediate activation of stem cells resident in VA of heart vessels and in Epi after MI. A major part of these cells endogenously transform into inflammatory phenotype. In summary, our results indicate that both adventitial and epicardial stem cells have to be considered in clinical management of acute MI and related healing processes including functional myocardial regeneration.

Kategorie: Poster

Poster 13:

Titel:Detection of tff1, tff2 and tff3 in synovial fluid

Autoren: Bechmann J.(1),Schicht M.(1),Klinger P.(2),Gelse K.(2),Claassen H.(3),Paulsen F.(1),

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Abstract:
Recently we have shown that the trefoil factor family peptide 3 (TFF3) supports catabolic functions in diseased articular cartilage widening our knowledge of the functional spectrum of TFFs and demonstrating that TFF3 is a multifunctional factor with the ability to link inflammation with tissue remodeling processes in articular cartilage. Moreover, our data revealed that TFF3 is a factor in the pathogenesis of osteoarthritis (OA). As in diseases like OA also other joint structures are involed, we here analysed a possible role for TFFs in synovial membrane (SM) and fluid (SF). We used quantitative RT-PCR, western-blot and ELISA to measure the expression of TFF3 in healthy SM and in SM from patients with OA or rheumatoid arthritis (RA) as well as expression of TFF1-3 in healthy SF and SF from OA and RA patients. All three TFFs could be detected in all samples of SF while only TFF3 was expressed in SM. Qantitative analysis revealed samples with upregulated or downregulated TFF3 expression also within one sample group such as for example SM from OA patients. The data demonstrate that TFFs are a component of SF. It is unclear who produces TFF1 and -2. The variable quantitative TFF3 expression suggests that much more information is needed about samples to give a statement about possible TFF3 functions in SM. Thus, for example it will be important to know whether samples were obtained from patients with early or late stage OA or whether these patients suffered from additional diseases, for example diabetes mellitus etc.

Kategorie: Poster

Poster 14:

Titel:Period1 regulates the rate of recovery from jet-lag by buffering the light input to the master circadian clock when: evolution lags behind

Autoren: Bechstein P.(1),Stehle J.(1),Rawashdeh O.(1),

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Abstract:
Jet-lag or desynchronosis, is a temporary disorder of the circadian system, a 21st century modern-day malaise that accompanied men's invention of the aircraft. From an evolutionary perspective, the circadian clock of the suprachiasmatic nucleus (SCN) is lagging behind technology. However, jet-lag can uncover valuable information on the molecular and physiological assembly of the circadian system. Accordingly, the SCN clock is structured to buffer abrupt environmental perturbations, like sudden shifts in local time, and nighttime light exposure. Considering that the clockwork component Period1 (Per1) is an immediate early target gene of the light input pathway to the SCN clock, we sought to determine its role in the adaptability of the master circadian clock to external changes in daytime. Accordingly, we used Per1 knockout (Per1-/-) mice, and analysed via locomotor activity recordings their flexibility to entrain to abrupt temporal shifts. We found that Per1-/- mice subjected to a jet-lag protocol of 5h phase delay/advance, simulating trans-meridian flights across 5 time-zones in both directions (east-bound and west-bound), exhibit immediate/accelerated phase-alignments of their rhythmic activity onsets to the shifted light/dark cycles, respectively, as compared to wild-type mice. We conclude from our study, that PER1 functions to buffer the strength of the light input stimulus, and thus, is essential for the gradual adaptation of the clock to shifts in local time. Currently, we are investigating the molecular details, with PER1 at its centre, involved in the controlled plasticity of the SCN. This could potentially help in developing therapies or preventatives to jet-lag.

Kategorie: Poster

Poster 15:

Titel:Relevance of the endoplasmic reticulum stress response for oligodendrocyte pathology

Autoren: Beißel C.(1),Nellessen L.(1),Clarner T.(1),Beyer C.(1),Kipp M.(1),

Adressen:(1)Institute of Neuroanatomy, Faculty of Medicine|RWTH Aachen University|Aachen|Germany; email:mkipp@ukaachen.de

Abstract:
A number of neurodegenerative and neuroinflammatory disorders are characterized by oligodendrogliopathy with concomitant microglia and astrocyte activation. It is presently not understood, why oligodendrocytes are specifically vulnerable, however, their high protein synthesis rate within the endoplasmic reticulum (ER) might play a critical role. Evidence for ER stress in oligodendrocytes has been reported in different brain diseases including multiple sclerosis. We, therefore, assumed that the so called “ER-stress response” orchestrates oligodendrocyte death. The cuprizone model displays selective oligodendrocyte apoptosis due to the inhibition of mitochondrial function. Using genome-wide array analyses, in situ hybridization and immunofluorescence double-labelling, we identified the transcription factor C/EBP homologous protein (CHOP), a member of the C/EBP family, as a putative mediator of oligodendrocyte death. In CHOP-deficient animals, oligodendrocytes were preserved, the activation of microglia diminished and the induction of distinct chemokines ameliorated. Furthermore, demyelination and concomitant axonal damage was less pronounced in animals lacking CHOP expression. Chemical inhibition of the respiratory chain on various levels induced CHOP in vivo, and the absence of CHOP reduced cell death. Interestingly, T-cell driven inflammation was not under the control of CHOP, pinpointing that this transcription factor is critical for neuroinflammatory events rather than orchestrating autoimmunity. Our results suggest that the specific vulnerability of oligodendrocytes in various brain disorders involves the ER-stress signaling cascade. Future studies have to show which downstream molecules are involved in CHOP-mediated oligodendrocyte apoptosis.

Kategorie: Poster

Poster 16:

Titel:The mystery of the all - does the anterolateral ligament really exist?

Autoren: Birkmaier S.(1),Runer A.(2),Brenner E.(2),

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Abstract:
Background: Despite having a possible clinical relevance little is known about the soft tissue structures in the anterolateral compartment of the knee joint. Purpose: To provide an independent view on the ligamentous structures on the anterolateral side of the knee with special emphasis on the anterolateral ligament (ALL). Design: Descriptive Laboratory Study Methods: 44 human cadaveric knees were dissected following a standardized dissection protocol to reveal the ALL and other significant structures in the anterolateral compartment of the knee joint. The ALL was defined according to most recent findings as a firm structure running in an oblique course from the lateral femoral epicondyle to the anterolateral tibia, with a bony insertion even there. Results: The ALL was identified in 45.5% of the dissected knee joints. The structure originates together with the lateral collateral ligament (LCL) or just posterior and proximal to it. With an enclosed angle of 19.5±4.5 degrees to the LCL, the ligament has an oblique course to the anterolateral tibia with a bony insertion between Gerdy’s tubercle and the fibular head. Conclusion: The ALL is a firm ligamentous structure in the anterolateral part of the knee present in 45.5% of the cases. Giving the course and the characteristics of this structure a function in providing rotational stability by preventing internal rotation of the knee can by hypothesized.

Kategorie: Poster

Poster 17:

Titel:Quantitative 3d differences in medial meniscus position between knees with and without subsequent structural knee osteoarthritis progression – data from the osteoarthritis initiative

Autoren:Bloecker K.(1),Eckstein F.(1),Dannhauer T.(1),Wirth W.(1),

Adressen:(1)Institute of Anatomy|Paracelsus Medical University|Salzburg|Austria; email:wolfgang.wirth@pmu.ac.at

Abstract:
Objective: Meniscus extrusion impairs the load distribution in the femorotibial joint and was reported to play an important role in knee osteoarthritis (KOA). In this cross-sectional case-control study, we investigated whether quantitatively assessed medial meniscus position measures differ between knees with and without subsequent cartilage loss. Methods: Each one knee with radiographic KOA and magnetic resonance imaging (MRI)-based cartilage thickness (ThC) and X-ray-based joint space width (JSW) assessments was selected from Osteoarthritis Initiative participants. Forty-five of the 504 eligible knees showed medial but not lateral compartment progression (ThC AND JSW loss) between baseline and year-one, whereas 228 knees showed no (medial/lateral) progression. Thirty-seven of the progressors (64.7±8.0y, 30.2±4.6kg/m², 35% males) were matched to 37 non-progressors (64.6±9.8y, 30.2±4.4kg/m²) by radiographic stage, pain, BMI, height, and sex. Segmentation of the medial tibial plateau and meniscus was performed using baseline coronal MRI to determine meniscus extrusion and tibia plateau coverage. Results: Meniscus extrusion was greater in the central part (3.3±1.4mm vs. 2.5±1.5mm; p<0.01 paired t-tests) but not over the entire medial meniscus (3.3±1.3mm vs. 3.0±1.5mm; p=0.14) when comparing progressors with non-progressors. The percentage of the tibial plateau covered by the entire meniscus did not differ between groups (34.6±12.5% vs. 36.8±13.5%; p=0.35). Conclusion: Overall tibia plateau coverage does not appear to impact subsequent cartilage loss, whereas central meniscus extrusion might play a role by impairing the load distribution in the central/external femorotibial joint, a region known to show substantial cartilage loss in knee osteoarthritis.

Kategorie: Poster

Poster 18:

Titel:Variation in number of the pulmonary veins

Autoren: Bordei P.(1),Noaptes A.(1),Bulbuc I.(1),Iliescu D.(1),Ispas S.(1),

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Abstract:
By plastic injection (Technovit 7143) followed by NaOH corrosion and angioCT exams, we described four cases with five pulmonary veins and five cases with three pulmonary veins. Among the cases with five pulmonary vein, three cases were on the right (two cases with double right superior pulmonary vein and one case with right double inferior pulmonary vein) and one case on the left, with superior left pulmonary veins. On the right side of the second superior pulmonary vein drained the middle lobe while the inferior supplementary vein drained the upper part of the middle lobe. The cases with three pulmonary veins resulted either from the confluence (at 2-3 cm from the atrial wall) of the left pulmonary veins, the superior and the inferior (in three cases) or the confluence of the superior pulmonary veins, the left and the right (two cases), when the pulmonary vein confluence was near the atrial wall (2-3 mm). On the cases detected by CT we also studied their openings within the atrium.

Kategorie: Poster

Poster 19:

Titel:The plate body - a birbeck granule-like organelle in the alveolar epithelial type II cell of the goat

Autoren: Brandenberger C.(1),Mühlfeld C.(1),

Adressen:(1)Institute of Functional and Applied Anatomy|Hannover Medical School|Hannover|Germany; email:muehlfeld.christian@mh-hannover.de

Abstract:
The plate body is a rare and irregularly occurring organelle of unknown function in alveolar epithelial type II cells of the lung. During a systematic electron microscopic study of the lungs of various mammals (ranging from the Etruscan shrew to camel and giraffe), we frequently observed plate bodies in alveolar type II cells in the lungs of the African pygmy goat. In the goat, this organelle was characterized by parallel arranged stacks of 2-6 membrane-bound cisternae, each of which was approximately 100 nm thick and possessed an electron dense, straight median line, parallel to the membrane boundary in its center. Electron tomography and subsequent 3D reconstruction revealed a connection with the rough endoplasmic reticulum and the inclusion of smaller sized vesicles within the cisternae. The ultrastructure of these organelles shows a striking similarity with Birbeck granules, which are thought to be almost specifically localized in Langerhans/dendritic cells. This finding places the plate body into a new perspective and raises questions about the function of this organelle in alveolar epithelial type II cells.

Kategorie: Poster

Poster 20:

Titel:The role of the antimicrobial peptide cramp in glial cell activation after bacterial stimulation

Autoren: Brandenburg L.(1),Kress E.(1),Soehnlein O.(2),Jansen S.(1),Tauber S.(3),Pufe T.(1),

Adressen:(1)Anatomy and Cell Biology|RWTH Aachen University|Aachen|Germany; email:lbrandenburg@ukaachen.de; (2)Institute for Cardiovascular Prevention|LMU Munich|Munich|Germany; (3)Department of Neurology|RWTH University Hospital Aachen|Aachen|Germany

Abstract:
Antimicrobial peptides (AP) are important components of the innate immune system, yet little are known about their expression and function in the brain. Our previous work revealed a higher mortality rate and up-regulation of proinflammatory gene expression as well as glial cell activation in cathelicidin-related antimicrobial peptide (CRAMP)-deficient mice after bacterial meningitis. However, the consequence of CRAMP deficiency for the glial cell function and their involvement in inflammation after bacterial meningitis remains unknown. Therefore, we used CRAMP-deficient and wildtype glial cells to investigate the role of antimicrobial peptide CRAMP in glial cell viability, inflammation and glial cell activation after bacterial stimulation. CRAMP-deficiency was associated with a stronger morphological change of glial cells, whereas the microglial cells showed a decreased viability after bacterial stimulation. The analysis of inflammatory response revealed increased expression of different proinflammatory cytokines and decreased expression of anti-inflammatory factors by CRAMP-deficient glial cells using realtime RT-PCR after bacterial treatment. CRAMP-deficient glial cells displayed a higher degree of glial cell activation that was accompanied by a stronger translocation of the transcription factor nuclear factor 'kappa-light-chain-enhancer' of activated B-cells (NFêB) after bacterial stimulation and endogen activation of the extracellular signal-regulated kinase 1/2 (ERK1/2), whereas anti-inflammatory signal transduction was decreased in glial cells. Furthermore, the CRAMP-deficient microglia showed a changed phagocytosis after bacterial treatment. Taken together, this work provides insight into the important role of CRAMP as part of the innate immune defense against pathogens and their involvement in glial cell function.

Kategorie: Poster

Poster 21:

Titel:5alpha-dihydrotestosterone controls spine synapse density in the hippocampus of male animals

Autoren: Brandt N.(1),Kind S.(1),Rune G.(1),

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Abstract:
In final steroidogenesis testosterone is either converted to estradiol by activity of aromatase or is irreversibly metabolized to 5alpha-dihydrotestosterone (DHT) by activity of 5alpha-reductase. Here we show that both enzymes are expressed in hippocampal neurons of both genders and as a consequence hippocampal neurons of male animals as well as of female animals, are capable of synthesizing sexual neurosteroids, such as DHT and 17beta-estradiol. Our recent findings showing that inhibition of estradiol synthesis aromatase results in impairment of LTP and loss of synapses in females but not in males, however, suggest a role of estradiol in females and testosterone in males with respect to hippocampal synaptic plasticity. In fact, DHT, a non-aromatizable androgen, results in increased density of spine synapses and of mature spines, the so-called memory spines, in males but not in females. Consistently, stereological counts of spine synapses revealed a significant spine synapse loss in “male” hippocampal slice cultures, but not in “female” hippocampal cultures, in response to treatment with finasteride, an inhibitor of 5alpha-reductase. In addition, flutamide, an inhibitor of the androgen receptor, decreased spine synapse density in “male” slice cultures. Taken together, our data indicate a sex-specific role of sexual neurosteroids, 17beta-estradiol in females and DHT in males, on synaptic stability of the hippocampus.

Kategorie: Poster

Poster 22:

Titel:The Innsbruck anatomy in the Third Reich - preliminary results

Autoren: Brenner E.(1),Klima G.(2),Konschake M.(1),Hörmann R.(1),Putz R.(3),

Adressen:(1)Division for Clinical and Functional Anatomy|Innsbruck Medical University|Innsbruck|Austria; email:erich.brenner@i-med.ac.at; (2)Division of Histology and Embryology|Innsbruck Medical University|Innsbruck|Austria; (3)University Council|Innsbruck Medical University|Innsbruck|Austria

Abstract:
Background: While numerous anatomical institutes already worked up their Nazi history, this is not yet done for the Anatomical Institute in Innsbruck. Results: The Chairman of the Institute during the Third Reich, Felix Sieglbauer, was professor of anatomy since 1918 and held this position until his retirement in 1946. About his person during the Third Reich only a few facts are known. Histology and Embryology was headed from 1937 by JÃ¼rgen Mathis, first provisionally and then from 1939 as appointed associate professor. Mathis was illegal party member prior to the annexation and was dismissed after the war in 1945. Among the 199 bodies transferred to the Innsbruck Anatomy, three groups can be identified: first, Executed from Munich-Stadelheim (N = 57), secondly victims from Stalag XVIII C St. Johann im Pongau (N = 29), mainly Russian prisoners of war, Stalag XVIII C / Z Landeck (N = 6) and the "Stalag Jenbach" (N = 4), and thirdly executed from Innsbruck martial courts (N = 2); more victims of executions are likely. A fourth, but not currently detectable group could constitute euthanasia victims. There are at least eight publications relying on bodies of NS victims. Conclusion: The previously very "thin" life stories and publication activities of the employees of Innsbruck's Anatomy and Histology (before and) during the Nazi era must be elaborated. In line with other publications, the origin of the bodies transferred to the Innsbruck Anatomy of the years 1938 - 1945 have to be examined and analyzed.

Kategorie: Poster

Poster 23:

Titel:Cellular and subcellular localization of ion-transporting proteins in the endolymphatic sac epithelium

Autoren: Brockhues J.(1),Hirt B.(1),Gleiser C.(1),

Adressen:(1)Clinical Anatomy and Cellular Analysis|Institut of Anatomy, University of Tübingen|Tübingen|Germany

Abstract:
The homeostasis of the inner ear fluids is mediated by sodium- and chloride-transporting proteins in the epithelium of the endolymphatic sac. Indirect evidence for a role of the endolymphatic sac epithelium in fluid homeostasis comes from the observation that obliteration of the endolymphatic sac in adult guinea pigs leads to an enlargement of the endolymphatic compartment. The endolymphatic sac epithelium is comprised of two cell types designated as ribosomal rich cells (RRCs) and mitochondrial rich cells (MRCs). Although a number of Na/Cl-transporting proteins have been identified in the endolymphatic sac in recent years, the knowledge about their cell type-specific expression and subcellular distribution in the ES epithelium is still fairly limited. In this study, we used immunohistochemistry to reveal the cell type-specific expression profiles of the Na/Cl-transporting proteins ENaC, NKCC1, Na+/K+-ATPase, Pendrin, and CFTR in the rat and human endolymphatic sac. We could confirm the expression of these Na/Cl-transporting proteins in the endolymphatic sac epithelium and found a differences subcellular expression patterns especially of NKCC1 and ENaC in comparison to other Na/Cl-transporting epithelia (e.g. kidney). Our data might form a basis for the determination of the molecular mechanisms of transepithelial NaCl- transport with pathophysiological relevance to diseases of the inner ear, such as Menière’s disease.

Kategorie: Poster

Poster 24:

Titel:Craniometry on equine skulls by means of a computer-aided 3-dimensional measuring device

Autoren: Brucker P.(1),Lang A.(1),Wrede T.(2),Gasse H.(1),

Adressen:(1)Institute of Anatomy|University of Veterinary Medicine Hannover|Hannover|Germany; email:anja.lang@tiho-hannover.de; (2)Faculty II - Mechanical Engineering and Bio Process Engineering|University of Applied Sciences and Arts|Hannover|Germany

Abstract:
Introduction: Measurements of distances between extracranial and intracranial bony structures are difficult to perform with standard devices when the intracranial structure is difficult to access. Therefore, a computerised 3-D measuring device (well established in industrial product engineering) was tested for its suitability in craniometry. Methods: Intracranial and extracranial Points of Interest (POIs) were marked after cutting the skulls of 38 horses in the median plane. Data were read in by touching and clicking the POIs with the tip of a Measurement Arm (FaroArm® Fusion, Stuttgart, Germany). The system assigned the POIs to x/y/z coordinates and calculated the direct distances. Afterwards, the software Microsoft Excel was used to calculate the distances between the planes on which two respective POIs were located (yielding distances in longitudinal, transversal or vertical directions). Results: The most rostral intracranial POI (P25) was always located rostral of the extracranial POI (P3) palpable in the fossa temporalis. The position of the most dorsal point on the processus zygomaticus (P4) corresponded, firstly, with the caudal third of the fossa cranii media – which bore the hypophysis – and, secondly, with the position of the senso-motoric cortex. This was independent of age. However, an increase with age often occurred when POI 16 (protuberantia occipitalis externa) was involved. Discussion / Conclusion: Craniometrical data are of key interest in veterinary medicine because of a lack of stereotactic atlases of the horse. The tested device facilitated craniometrical measurements of high accuracy and precision. The POIs' positions were either constant or shifting with age.

Kategorie: Poster

Poster 25:

Titel:Invasiveness, migration potential and tumor formation capacity of different retinoblastoma cell lines as revealed by quantitative cam assay

Autoren: Busch M.(1),Dünker N.(1),

Adressen:(1)Department of Neuroanatomy|University of Duisburg-Essen, Medical Faculty|Essen|Germany; email:Nicole.duenker@uk-essen.de

Abstract:
Retinoblastoma (RB) is the most common malignant intraocular childhood tumor occurring as both, a heritable (usually bilateral) and non-heritable (unilateral) form. The most important factor for its prognosis is the extension of invasion and dissemination of the retinoblastoma cells and the formation of metastasis. In the present study, we characterized 8 retinoblastoma cell lines with regard to (i) their anchorage-independent growth as revealed by their colony formation potential in soft agar and (ii) their invasiveness as detected by chick chorioallantoic membrane (CAM) assays. Quantification of the migratory potential of the different RB cell lines was performed by Real-time PCR analyses using human specific primers and generating cell line based standard curves. Contradicting former reports, most of the RB cell lines analysed were able to form colonies in soft agarose after single cell seeding within 3 weeks of incubation. Upon inoculation of different GFP labelled RB cell lines on the dorsal “upper” CAM of chick embryos in ovo, variable amounts of GFP-positive human tumor cells were detectable in the ventral “lower” CAM, indicating diverse invasion and migration potentials. Three RB cell lines caused tumor formation near the inoculation site on the “upper” CAM. All RB cell lines exhibited the potential to extravasate from the capillary system after intravenous CAM injection. Our data indicate that the chick CAM assay provides a valuable tool for cancer research. Combined with Real-time PCR analyses this assay allows for the quantitative determination of the migration and invasion capacity of different tumor cells under in vivo like conditions.

Kategorie: Poster

Poster 26:

Titel:Maldevelopment of dermal lymphatics in wnt5a-knockout-mice

Autoren: Buttler K.(1),Becker J.(1),Pukrop T.(2),Wilting J.(1),

Adressen:(1)Anatomy and Cell Biology|University of Göttingen|Göttingen|Germany; email:buttler.kerstin@med.uni-goettingen.de; (2)Hematology and Oncology|University of Göttingen|Göttingen|Göttingen

Abstract:
Maintenance of tissue homeostasis and immune surveillance are important functions of the lymphatic vascular system. By gene microarray expression studies we recently compared human lymphatic endothelial cells (LECs) with umbilical vein endothelial cells (HUVECs). Here, we followed up on these studies. Besides well-known LEC markers, we identified differentially expressed WNT pathway components, which play important roles in the morphogenesis of various organs, including the blood vascular system. WNT signaling has not yet been addressed in lymphangiogenesis. We found high expression of FZD3, FZD5 and DKK2 mRNA in HUVECs, and WNT5A in LECs. The latter was verified in normal skin-derived LECs. With immunohistological methods we detected WNT5A in LECs, as well as ROR1, ROR2 and RYK in both LECs and HUVECs. In the human, mutations of WNT5A or its receptor ROR2 cause the Robinow syndrome. These patients show multiple developmental defects including the cardiovascular system. We studied Wnt5a-knockout mouse embryos and show that the number of dermal lymphatic capillaries is significantly lower in Wnt5a-null-mice. However, the mean size of individual lymphatics and the LEC number per vessel are greater. In sum, the total area covered by lymphatics and the total number of LECs are not significantly altered. The reduced number of lymphatic capillaries indicates a sprouting defect rather than a proliferation defect in the dermis of Wnt5a-ko-mice. Functional analyses of these mice reveal a delay of lymph fluid uptake of the initial lymphatics and the absence of centrifugal transport by lymphatic collectors. These results identify Wnt5a as a regulator of lymphangiogenesis. (Dev Biol 2013; 381:365-376)

Kategorie: Poster

Poster 27:

Titel:Quantitative proteomics identify a synaptic correlate of acute ethanol intoxication

Autoren: Cambridge S.(1),Schneider N.(1),Krüger M.(2),

Adressen:(1)Functional Neuroanatomy|Institute of Anatomy and Cell Biology|Heidelberg|Germany; email:cambridge@ana.uni-heidelberg.de; (2)Proteomics|Max-Planck-Institute for Heart and Lung Research|Bad Nauheim|Germany

Abstract:
The behavioral effects of acute ethanol intoxication are well documented, but surprisingly little is known about the underlying molecular mechanisms. The main reason for this is that global analysis of protein changes following an acute synaptic stimulus has so far not been possible. We therefore sought to establish a high-resolution mass spectrometry approach that would allow precise comparison of stimulated vs. control synaptic proteomes. To this end, we achieved quantification of over 2000 mouse hippocampal synaptic proteins upon physiological ethanol stimulation and 72 proteins changed significantly up to two-fold and more. Several of these proteins are involved in basal synaptic transmission as well as synaptic plasticity thereby establishing a molecular link to the ethanol-induced behavioral phenotypes. In addition, we identified proteins with associations to mood, apoptosis, or (neurodegenerative) diseases. We thus discovered a group of candidate proteins that represents a synaptic correlate of acute ethanol intoxication.

Kategorie: Poster

Poster 28:

Titel:Melatonin-dependent rhythmicity in cell proliferation in the median eminence and pituitary of adult mice

Autoren: Christ E.(1),Fredrich M.(1),Korf H.(1),

Adressen:(1)Dr. Senckenbergische Anatomie, Dr. Senckenbergisches Chronomedizinisches Institut|Goethe-Universität|Frankfurt|Germany

Abstract:
Cell proliferation in the adult hypothalamic-pituitary system is required to adjust neuroendocrine circuits to environmental stimuli. The hypothalamic-pituitary system is subjected to diurnal/circadian rhythms both on the molecular and behavioral level. We studied the median eminence (ME), the pars tuberalis (PT) and pars distalis (PD) of male adult mice to investigate whether cell proliferation follows a diurnal rhythm controlled by melatonin signaling. Melatonin-proficient C3H mice, melatonin-deficient C57Bl mice and melatonin-proficient mice with targeted deletion of both melatonin receptors (MT1/2 double KO) were adapted to a 12h light/ 12h dark cycle and sacrificed at ZT00, 06, 12 and 18. Immunohistochemistry for Ki67, a nuclear marker for all active stages of the cell cycle, served to measure cell proliferation. In all regions and strains analyzed, we found ongoing cell proliferation. In the PT it was constitutive and showed no rhythm. In contrast, the ME and the PD showed daily fluctuations in cell proliferation in C3H animals. In the ME the number of proliferating cells was increased significantly at ZT12, whereas in the PD cell proliferation was decreased at ZT6. Notably, cell proliferation in the ME and the PD of C57Bl and MT1/2 KO mice showed no daily rhythm. In summary, our results indicate that cell proliferation in the ME and PD of C3H mice underlies a distinct day/night rhythm while cell proliferation in C57Bl and MT1/2 KO mice remains constant over the day. Therefore we suggest that melatonin signaling is involved in the control of rhythmic proliferation in ME and pituitary.

Kategorie: Poster

Poster 29:

Titel:Implications for menopausal osteoarthritis: human articular chondrocytes express aromatase (cyp19a1) and use enzymes involved in estrogen metabolism

Autoren: Claassen H.(1),Schicht M.(2),Ernst J.(1),Nielitz A.(1),Fester L.(3),Tsokos M.(4),Guddat S.(4),Bräuer L.(2),Bechmann J.(2),Delank K.(5),Wohlrab D.(5),Paulsen F.(2),

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Abstract:
Sex hormones, especially estrogens, have been implicated in articular cartilage metabolism and the pathogenesis of menopausal osteoarthritis (OA). The conversion of androstendione into estrone (E1) and testosterone into 17beta-estradiol (E2) by aromatase (CYP19A1) plays a key role in tissues supposed to synthesize estrogens endogenously. Therefore, we analyzed expression of aromatase in immortalized C-28/I2 and T/C-28a2 chondrocytes as well as in cultured primary human articular cartilage cells. Additionally, we determined whether incubation with aromatase inhibitor letrozole or incubation with 17beta-estradiol influence estrogen metabolism. Our results revealed that human articular cartilage express aromatase at mRNA and protein levels. Blocking of estrogen synthesis by aromatase inhibitor letrozole was counteracted by an increase in estrogen receptors ER-alpha and ER-beta. Furthermore, the catabolic enzyme CYP1A1, which hydroxylates estrone, was increased after blockade of estrone synthesis with letrozole. Concomitantly, synthesis of estrone (E1) was downregulated after incubation with letrozole. Following incubation with 17beta-estradiol, the amount of estrogen concentrations in chondrocytes was not influenced. Surprisingly, mRNA of the enzyme CYP1A1 was also increased after incubation with physiological concentrations of 17beta-estradiol. In conclusion, our present results suggest that articular chondrocytes produce estrogens themselves and are independent of extern estrogen metabolism. Estrogen receptors are activated after estrogen synthesis is suppressed by aromatase inhibitor letrozole as well as after chondrocytes are stimulated with 17beta-estradiol.

Kategorie: Poster

Poster 30:

Titel:Right subclavian arteries with retro-esophageal traject

Autoren: Cobzariu A.(1),Chiriloaie C.(1),Iorga A.(1),Bordei P.(1),Iliescu D.(1),

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Abstract:
We describe four cases of right subclavian artery with retro-esophageal traject, two cases discovered by dissection and the other two cases by angioCT. In both cases discovered by dissection the common carotid arteries, right and left, started from a bicarotid trunk originating from the aortic arch, anterior to the origin of the right subclavian artery; the bicarotid trunk bifurcates after about 1 cm from its origin. The bicarotid trunk bifurcation was on the left side of the tracheo-esophageal duct so the left common carotid passed anterior to the trachea to reach its normal position. The left subclavian artery showed a normal origin and traject. In cases discovered by angioCT, in one case there is a short bicarotid trunk with the origin anterior to the origin of the right subclavian artery. In the other case, the common carotid arteries had their origins separately from the aortic arch; posterior to them is the origin of the left subclavian artery and posterior to it was the origin of the right subclavian artery.

Kategorie: Poster

Poster 31:

Titel:Peroxisomes in cardiomyocytes: potential cardiac roles for a neglected organelle

Autoren: Colasante C.(1),Chen J.(2),Ahlemeyer B.(2),Baumgart-Vogt E.(2),

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Abstract:
Peroxisomes in cardiomyocytes: potential cardiac roles for a neglected organelle The heart is an organ that relies on the degradation of fatty acids to provide the energy to sustain its contractile power. In cardiomyocytes, enzymes involved in the beta-oxidation of fatty acids are located in both peroxisomes and mitochondria. Mitochondrial breakdown of fatty acids and ATP-production have been thoroughly investigated in heart tissue. In contrast, relatively scarce information is available on the role of peroxisomal beta-oxidation and metabolism in cardiomyocytes and in the development of heart failure. Peroxisomes compartmentalise critical cellular processes like the degradation of reactive oxygen species and of a variety of fatty acids (phytanic acid, arachidonic acid, leukotrienes, prostaglandins) as well as the biosynthesis of membrane lipids (cholesterol, plasmalogens). Alterations of peroxisomal metabolism and biogenesis can cause deleterious disorders (Zellweger Syndrome), and importantly, patients with peroxisomal diseases such as Refsum´s disease can develop heart failure. Under pathological conditions (diabetes, obesity) cardiomyocytes are overloaded with lipids and reactive oxygen species, wherefore peroxisomes could play an important role protecting the heart against oxidative and lipotoxic stress. We present evidence that peroxisome-related genes are differentially expressed in the four heart chambers and demonstrate that in cardiomyocytes already mild peroxisomal biogenesis defects induce alterations in protein expression and peroxisome morphology potentially leading to disturbances of cardiomyocyte function. Further, peroxisomal beta-oxidation is regulated by peroxisome proliferator-activated receptors, the ligands of which are degraded inside the peroxisomes. This suggests a peroxisome/peroxisome proliferator-activated receptors-feedback loop for the modulation of cardiac lipid homeostasis.

Kategorie: Poster

Poster 32:

Titel:Subregional femorotibial cartilage thickness change in a model of early, pre-radiographic human knee osteoarthritis

Autoren:Cotofana S.(1),Wirth W.(1),Maschek S.(2),Kwoh C.(3),Ladel C.(4),Eckstein F.(1),

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Abstract:
To study longitudinal change in femorotibial cartilage thickness in knees without radiographic osteoarthritis (ROA), in subjects with moderate to advanced ROA in the contralateral knee. We identified 211 (of 4796) participants from the Osteoarthritis initiative (OAI) without ROA) in one knee (KLG0), with definite ROA in the other knee (KLG≥2) and with 3T MRI data at baseline and 2-year follow-up. Segmentation of the 4 femorotibial cartilage plates of the case (KLG0) knee was performed with blinding to time point. Cartilage thickness change in subregions was compared with that in 88 references subjects (no pain in either knee, bilateral KLG0, no risk factors). The contralateral ROA status of the 211 participants (64±9 yrs., 60% women, BMI 28±4.2) was: 161 CL KLG2; 50 CL KLG 3/4). There was no indication of greater cartilage thickening in case knees in external central medial (weightbearing) femoral cartilage subregion or across all subregions (SRThick Score). However, there was greater cartilage thinning in internal lateral tibial cartilage subregion (p=0.05) and across all subregions (SRThinn Score; p=0.02) in (KLG0) case knees compared with knees of reference subjects. Greater thinning in case knees was observed in the total femorotibial joint (FTJ) and in the central medial compartment, but the differences did not reach statistical significance (p=0.09; 0.06). In this model of early, pre-radiographic knee OA, we find evidence of larger rates of subregional cartilage thinning (but not thickening) compared with healthy references. Such model may be useful to test the effect of preventive disease modification in clinical trials.

Kategorie: Poster

Poster 33:

Titel:The clinical – functional anatomy of the teres major muscle

Autoren: Dancker M.(1),Lambert S.(2),Brenner E.(1),

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Abstract:
Background: Information in recent literature about the Teres Major Muscle (TM) is lacking or contradictory. Exact information about its attachment footprint and neurovascular supply is clinically relevant for its use as a substitute in reconstructive shoulder surgery. We set out to define the muscle's surgically relevant anatomy in humans. Methods: 30 embalmed upper extremities (15 cadavers; 7 females) were investigated. The neurovascular pedicle(s) of the TM was dissected, characterized and measured. The TM and Latissimus Dorsi Muscle (LD) were then removed and their attachment footprints investigated. Results: The TM was largely innervated by the lower subscapular nerve (LSN); in 10%, the thoracodorsal nerve was the exclusive innervation. The neurovascular entry was located close to the muscle's center part. The TM and the LD inserted discretely: the TM attached on the crest of the lesser tubercle, whereas the LD attached within the bicipital groove. The TM’s attachment footprint was averagely twice as big as that of LD. A separate strand of muscular fibers dorsal to the proximal third of the tendon was found in 50% of all cases. This additional head inserted on the humerus with a short (<3 mm) tendon. Conclusion: These results contradict current literature. The TM attachment and its relation to the LD attachment have been described exactly. The LSN innervates the TM in 90% of cases. The length of the vascular leash is the limiting factor in case of a pedicled transfer. The knowledge of the additional TM head is clinically relevant for a posterior surgical approach.

Kategorie: Poster

Poster 34:

Titel:Quantitative relationship of thigh adipose tissue with pain, radiographic status, and progression of knee osteoarthritis - longitudinal findings from the osteoarthritis initiative

Autoren: Dannhauer T.(1),Ruhdorfer A.(1),Wirth W.(1),Eckstein F.(1),

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Abstract:
OBJECTIVE: To explore the relationship of thigh subcutaneous fat (SCF) and inter-muscular fat (IMF) content with knee osteoarthritis (KOA) cross-sectionally and longitudinally, using quantitative magnetic resonance imaging. Specifically, we examined relationships with frequent knee pain, various radiographic strata, and structural progression status of KOA. METHODS: Subjects who showed between-knee discordance of frequent vs. no pain (n=48), osteophyte vs. no radiographic KOA (n=55), and radiographic joint space narrowing (JSN) vs. no JSN (n=44) were selected from the Osteoarthritis Initiative. Knees with structural progression of KOA (n=23) were compared with knees without progression. IMF and SCF were determined from axial thigh MRIs. Differences between knees, and between baseline and two-year follow-up, were examined using paired t-tests. RESULTS: Women displayed similar amounts of IMF, but twice the SCF of men. Limbs of women with frequently painful knees had statistically significant greater IMF areas (+4.2%; p=0.05) than contralateral pain-free limbs. No significant cross-sectional differences were observed between other strata. Men with structural progression appeared to have a greater longitudinal increase in SCF (+13.2%; $p<0.05$) than men without progression (-1.9%), and women with progression appeared to have a greater increase in IMF (+11.6%) than those without progression (+1.5%). CONCLUSION: In women, painful knees display greater IMF content than contra-lateral pain-free knees. Other between-knee comparisons did not reveal a regional association between radiographic KOA and thigh adipose tissue status. Structural progression of KOA may be associated with greater longitudinal increases of SCF in men and greater increases of IMF in women, compared with non-progressive controls.

Kategorie: Poster

Poster 35:

Titel:Neuromuscular junction formation using hipsc co-culture system: relevance to als and pms autistic disorder

Autoren:Demestre M.(1),Lutz(1),Böckers(1),

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Abstract:
In amyotrophic lateral sclerosis (ALS) upper and lower motoneurons degenerate leading to muscular atrophy and respiratory failure. However, not only motoneurons but also skeletal muscles, more precisely the neuromuscular junction (NMJ), are affected. In other pathologies, such as Phelan McDermid syndrome (PMS), neurological defects result from haploinsufficiency of SHANK3, which is deleted in almost all PMS patients. However, PMS patients often suffer from hypotonia. SHANK3 is not only localised at post synaptic densities of the CNS but also in postsynaptic specializations of the PNS, indicating a possible involvement at the NMJ. Induced pluripotent stem cells (iPSC) offer a great tool for the generation of patient-derived cells carrying a specific mutation. Previously we had established hiPSC-derived motoneurons and currently we have generated hiPSC-derived myogenic cells by PAX7 induction or, using a non-genetic approach, by cell selection and adding myogenic factors. Myogenic cells expressed myogenic markers and differentiated cells fused, formed multinucleated striated myotubes and expressed differentiation markers. Myotubes also contracted electrophysiologically, responded to acetylcholine and formed action potentials. More importantly, we were able to generate co-cultures combining motoneurons and myotubes generated from the same patient hiPSC cell lines. In these co-cultures, the aggregation of acetylcholine receptors and the formation of NMJ were seen. This is of great importance, as an in vitro culture system mimicking in vivo condition is the prerequisite for developmental, pathogenic and target drug studies, especially for those diseases in which motoneurons and the NMJ are affected.

Kategorie: Poster

Poster 36:

Titel:Human adult dental pulp cd117/c-kit-positive networks of stromal cells

Autoren: Didilescu A.(1),Rusu M.(2),Manoiu V.(3),Pop F.(4),Jianu A.(5),

Adressen:(1)Embryology|Carol Davila University of Medicine and Pharmacy|Bucharest|Romania; email:andreea.didilescu@gmail.com; (2)Anatomy|Carol Davila University of Medicine and Pharmacy|Bucharest|Romania; (3)Department of Cellular and Molecular Biology|National Institute of Research and Development for Biological Sciences|Bucharest|Romania; (4)Anatomical pathology|Carol Davila University of Medicine and Pharmacy|Bucharest|Romania; (5)Anatomy|Victor Babes University of Medicine and Pharmacy|Timisoara|Romania

Abstract:
Dental pulp tissue was collected from six healthy adult patients, prior to prosthetic treatments, in order to evaluate the in situ phenotype of dental pulp stem cells (DPSCs). Immunohistochemistry on paraffin-embedded specimens revealed the presence of CD117/c-kit+ stromal networks. Scarce CD146+ DPSCs were also found. Stromal cells were CD44+ in the pulp core, whilst they were CD44- in the cell rich zone. Negative phenotypes for CD34, CD105 and nestin were assessed. The c-kit networks contacting nerves were suggesting the presence of either interstitial Cajal-like cells or transition stages of DPSCs. By means of transmission electron microscopy, further proofs were brought for a progenitor phenotype of those stromal cells building extensive networks within the dental pulp. Seemingly, the DPSC niche is rich in progenitor cells which ensure stromal signaling through networks and provide feedback regulation to their parent cells.

Kategorie: Poster

Poster 37:

Titel:Sex-differences of infrapatellar fat pad (or Hoffa) volume in relation to inter- and subcutaneous fat

Autoren: Diepold J.(1),Ruhdorfer A.(1),Wirth W.(1),Dannhauer T.(1),Steidle E.(1),Eckstein F.(1),

Adressen:(1)Institute of Anatomy|Paracelsus Medical University|Salzburg|Austria; email:julian.diepold@pmu.ac.at

Abstract:
The infra-patellar fat pad (IPFP) or –œHoffa- is composed of intra-articular adipose tissue; it represents a source of pro-inflammatory cytokines and has been associated with knee osteoarthritis. However, to what extent the size of the IPFP differs between men and women, and how these sex differences compare to those in inter-muscular and subcuteaneous adipose tissue content is unknown. We studied healthy subjects from the Osteoarthritis Initiative without knee pain, or radiographic signs or risk factors of femorotibial osteoarthritis. Sagittal spin echo magnetic resonance images (MRIs) of 99 knees were used to segment the IPFP, and axial images of the thigh to segment inter-muscular and subcutaneous fat in a subset. Men (n=40) displayed a 41% greater (p<0.001) IPFP volume and a 9% greater (p<0.01) ratio of IPFP volume/body weight than women (n=59). Men (n=13) displayed 15% greater inter-muscular fat (not significant), and 50% smaller (p<0.01) subcutaneous adipose tissue areas than women (n=12); the differences were +2% (not significant) and â€“53% (p<0.001), respectively, when related to total thigh cross-sectional areas. In conclusion, this is the first study to explore quantitative measures of the IPFP in healthy men and women, and to relate these to sex differences of inter-muscular and subcutaneous adipose tissue content. Men displayed a significantly greater ratio of IPFP volume/body weight than women, similar amount of inter-muscular fat, and strikingly less subcutaneous fat. These data provide a basis for further systematic studies of the variability of the IPFP with the body mass index and its role in knee osteoarthritis.

Kategorie: Poster

Poster 38:

Titel:Peculiar morphological aspects of the left hepatic vein

Autoren: Dina C.(1),Leonte T.(1),Bordei P.(1),Iliescu D.(1),

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Abstract:
Our study was performed on a total of 128 cases represented by dissection, contrast injection followed by radiography, plastic injection (Technovit 7143) followed by NaOH corrosion and ultrasounds performed on healthy subjects. Several tributaries (2 to 6) form the left hepatic vein. At the confluence of its tributaries, the left hepatic vein showed a dilated venous sinus, continued by the vein itself. The most common path of the venous trunk collecting branches left shows a radial disposition. The left hepatic vein receives the middle hepatic vein in 47.62% of male cases and 31.54% of female cases. The caliber of the left hepatic vein was greater than the left terminal branch of the hepatic portal vein in 45% of cases and greater than the right terminal branch of the hepatic portal vein in 57.5% of cases.

Kategorie: Poster

Poster 39:

Titel:Endogenous melatonin suppresses hippocampus-dependent working memory performance in mice

Autoren: Eckardt I.(1),Bechstein P.(1),Tosini G.(2),Stehle J.(1),Rawashdeh O.(1),

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Abstract:
The circadian system modulates hippocampus-dependent cognitive performance with mechanisms of action unknown. We detected in the hippocampus numerous memory-relevant signaling components cycling across a 24h period (Jilg et al.,2010; Rawashdeh et al.,2014). Moreover, our previously work encourages that hippocampal rhythmicity is the product of cycling stimuli that signal to the hippocampus. One potential candidate of a temporal messenger (-œZeitgeber-•) for the hippocampus is pineal melatonin -œthe hormone of darkness-• . We therefore, compared hippocampus-dependent working memory (WM) performance between wildtype (C3H; WT) mice and C3H-mice lacking both melatonin receptors (MT1/MT2). Our data show that in WT-mice spatial WM performance declines during the second half of the night, thus, when melatonin levels peak, as compared to early nighttime, when melatonin levels are low. To confirm causality between melatonin and the nighttime WM deficit, we assessed the efficiency of WM performance in MT1/MT2 deficient-mice. The data reveal that in the absence of melatonin receptors, WM performance is significantly better. To exclude ontogenetic compensatory mechanisms in MT1/MT2 deficient-mice, we also assessed WM performance in WT-mice after surgically silencing the sympathetic nervous tone to the pineal gland, and thus, melatonin synthesis. The operated WT-mice show a similar improvement in WM performance during the second half of the night, thus, matching observations made in MT1/MT2 deficient-mice. We conclude that nighttime melatonin functions as a Zeitgeber to modulate hippocampus-dependent WM. In search for the mechanism of melatonin action on nighttime memory performance we are currently identifying hippocampal memory-relevant signaling molecules modulated by endogenous melatonin.

Kategorie: Poster

Poster 40:

Titel:Insulin-like growth factor-I is expressed in classical and nodular lymphocyte-predominant Hodgkin´s lymphoma tumour and microenvironmental cells

Autoren: Eppler E.(1),Link K.(1),Janas E.(2),Weidmann L.(2),Bischofberger H.(2),Wenger M.(2),Tinguely M.(3),Moch H.(4),Fellbaum C.(5),

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Abstract:
Hodgkin´s lymphoma (HL) is among the most frequent nodal lymphomas in the Western world. HL is classified in two disease entities: nodular lymphocyte-predominant Hodgkin´s lymphoma (NLPHL) and classical Hodgkin´s lymphoma (cHL, 95% of all HL). HL lesions are characterized by a minority of clonal neoplastic cells, namely in cHL Hodgkin the Reed-Sternberg cells and their variants, and in NLPHL the lymphocyte-predominant (LP) cells, respectively, both within a microenvironment of, e.g., reactive T and B cells, macrophages, and granulocytes assumed to support proliferation and maintenance of the neoplastic cells through cytokines, chemokines and growth factors. Insulin-like growth factor I (IGF-I) is an important growth factor involved in proliferation, differentiation, apoptosis and cell survival of numerous - including immune - tissues, and there exist indications for a role in tumour pathogenesis and sustainment. Although in recent years evidence has accumulated that HL is characterized by a profound disturbance of cell differentiation and apoptosis mechanisms, a potential involvement of IGF-I in HL has not been systematically investigated to date. We have localized IGF-I by double-immunofluorescence in frequent neoplastic cells of all cHL and NLPHL cases investigated. Additionally, IGF-I immunoreactivity was detected in high endothelial venules and different immune cell types within the surrounding tissue including neutrophilic granulocytes, macrophages, and follicular dendritic cells. We assume that IGF-I plays an anti-apoptotic role in tumour pathogenesis and in shaping the tumour microenvironment.

Kategorie: Poster

Poster 41:

Titel:3d reconstruction of sem images with photogrammetry

Autoren: Eulitz M.(1),Jäger D.(1),Reiss G.(1),

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Abstract:
Purpose: In biomedical research, three-dimensional (3D) reconstruction is widely used for structure analysis. We have developed a simple and non-destructive method of 3D surface reconstruction from scanning electron microscopy (SEM) objects/samples. Method: In optical photography, photogrammetry is a well-known method of producing 3D models from series of overlapping images. Series of images are taken in a circle around the object. Software programs are used to stitch the overlapping images and to generate a 3D point cloud. In a following step, the 3D point cloud can be converted into a triangular 3D mesh model and finally be printed as a 3D model. We adapted this method to the characteristics of SEM. Instead of moving the camera around the object, the object itself is rotated in multiple circles. To demonstrate the workflow of our method, a rabbit kidney glomerulus was used and prepared according to the OTOTO-method for SEM. Overlapping images taken by a SEM were stitched and converted into a 3D model using the same software as commonly used for optical photogrammetry. Results: 3D reconstruction of kidney glomerulus SEM images produced a realistic and high-resolution 3D mesh model. The 3D printing resulted in a model with only slightly reduced resolution. Conclusion: Not all SEM objects are suitable for our method of 3D reconstruction. Quality of the 3D model depends on size, shape and surface structure of the object. However photogrammetry in many cases seems to be a useful method of 3D surface reconstruction, also for SEM.

Kategorie: Poster

Poster 42:

Titel:Evaluation of nucleolar organizer regions (NORs) in neoplasia

Autoren: Fatu I.C.(1), Fatu C.(2), Radulescu D.(1), Fatu A.M.(1), Vascu B.M.(1), Moscu M.(1)

Adressen:(1)U.M.F. “Gr. T. Popa” Iasi, Romania; (2)Apollonia University, Iasi, Romania

Abstract:
Nucleolar organizer regions are parts of chromosomes that code ribosomal RNA and correlate to cellular proliferation. They have been identified by means of an argyrophilic technique that reveals NORs as black dots in the nuclei. The method has been recently applied in some malignancies, as lymphoma or melanoma and few data are about hormonal-dependent tumours. Our aim was to find a correlation between total number of Ag-NORs and histopathology diagnosis in soft tissue tumors. Material and method: We studied 27 cases of formalin fixed paraffin embedded soft-tissue tumors and the number of Ag-NORs was evaluated in both epithelial and stromal components. Results: A number of 12 cases had benign lesions. Total number of Ag-NORs was found to correlate with mitotic counts both in benign lesions and malignancies. The results of our study pointed out that in malignancies the number of Ag-NORs significantly exceeded those of benign lesions. We conclude that the Ag-NOR technique finds increasing application in detecting malignant tumors but it has to be correlated to diagnostic histopathology.

Kategorie: Poster

Poster 43:

Titel: Progesterone receptor expression in the mammary gland tumors

Autoren: Folescu R.(1),Sisu A.(1),Moise M.(1),Motoc A.(1),Zamfir C.(2),

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Abstract:
In the primary mammary malignant tumors, including in situ carcinoma, it is recommended the carrying out of immunohistochemical diagnosis for the progesterone receptors (PR). We studied the PR expression in malignant tumors, trying to identify the corresponding phenotypes according to the presence of these tumors. We have carried out a study on a total number of 80 carcinomas, divided into two groups: the first one constituted of 54 cases of carcinomas on which we had clinical data, and another group, constituted of 26 cases, where no clinical data was available. The normal mammary tissue contains PR. PR were positive in a percentage of 30% (24) and out of the positive cases, four (16.6%) were weak positive (PR1+), 13 (54.16%) moderate positive (PR2+) and seven (29.16%) intense positive (PR3+). Out of the in situ ductal carcinomas, only two (40%) have been moderately positive (PR2+), the cribriform type and one of the solid type. DCIS with apocrine differentiation have been PR negative. Invasive ductal carcinoma have constituted the most frequent histological type and accordingly presented the highest number of positive cases. Thus, 14 out of 48 (29%) were PR positive. According to the preset quantification with an intensity and a percentage score, three cases have been quantified as being weak positive (PR1+), six moderate positive (PR2+), five intense positive (PR3+). PR is a weaker predictor for the endocrine therapy response, but in exchange, it offers important information about the clinical evolution of the disease. Keywords: mammary, malignant tumor, progesterone, receptor.

Kategorie: Poster

Poster 44:

Titel:Histopathological and imaging modifications in chronic ethanolic encephalopathy

Autoren: Folescu R.(1),Sisu A.(1),Moise M.(1),Zamfir C.(2),Motoc A.(1),

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Abstract:
Chronic ethanolic encephalopathy is characterized by a spectrum of two groups separated by Wernicke and Korsakoff symptoms. Another type of encephalopathy associated with chronic ethanol consumption is represented by the Marchiafava-Bignami malady or syndrome, an extremely rare neurological disorder, which is characterized by a demielinization of corpus callosum, extending as far as a necrosis. Central lesions studies in chronic ethanolic patients was used in macroscopical tracking using MRI in chronic ethanolic patients as well as histopathological lesions found in cadavers using organ fragments gathered in the IML institute Timisoara, and the statistic taken into account was carried on a period of 5 years (2008-2012) on 790 fragments. Cadaver fragments biopsies were used in order to make histological slides. The staining used was hematoxilin-eosin, Because the frequence of ethanolic encephalopathy is increased and plays a major role in the sudden death of ethanolic patients we have studied the chronic ethanolic encephalopathy both in deceased and in living patients presenting different pathologies related to chronic ethanol consumption. Out of a total number of 790 chronic ethanolic patients deceased, which were studied in the last 5 years, we have found inchoate or advanced microscopic changes. The most frequent associated pathology are myocardial fibrosis, myocardial infarction and hepatic cirrhosis. Acute etanolic intoxication, followed by death in ethanol dependent patients is rare.
Keywords: Ethanolic encephalopathy, corpus callosum degeneration, Marchiafava Bignami syndrome, MRI and CT diagnose.

Kategorie: Poster

Poster 45:

Titel:Promoting effect of reelin on dendritic golgi translocation is blocked by inhibition of rac1-specific guanine nucleotide exchange factors stef/tiam1

Autoren:Förster E.(1),Kawauchi T.(2),Meseke M.(1),

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Abstract:
In the cerebral cortex of reeler mutant mice lacking expression of the extracellular matrix protein reelin, neurons are not only malpositioned, but also display misoriented apical dendrites and polarization defects (Förster, 2014). While neuronal migration defects in reeler have been studied in great detail, it is poorly understood how misorientation of apical dendrites and neuronal polarization defects are related to reelin deficiency. In radially migrating neurons in wild type, the Golgi apparatus transiently translocates into the developing apical dendrites, an event that is thought to represent an important step in dendritic polarity development. Recently, we could show that dendritic Golgi translocation is promoted by reelin via Cdc42/Rac1-dependent signalling, involving the Cdc42/Rac1 guanine nucleotide exchange factor (GEF) alphaPIX/Arhgef6 as a downstream component of a reelin modulated signaling pathway (Meseke et al., 2013). Likely, the role of different Cdc42/Rac1-specific GEFs in dendritic Golgi translocation is redundant. Here, we studied the role of Rac1-specific STEF/Tiam1 in dendritic Golgi translocation. These GEFs were previously shown to play a pivotal role for neuronal migration in vivo. Hippocampal neurons were transfected with plasmids expressing either dominant-negative STEF/Tiam1 or eGFP, respectively. While reelin treatment significantly promoted dendritic Golgi translocation in eGFP-transfected neurons, confirming our previous results, this reelin effect was blocked in neurons expressing dominant-negative STEF/Tiam1. Our findings suggest that STEF/Tiam1 play a crucial role in mediating the reelin effect on dendritic Golgi translocation. References: Meseke et al. (2013) Eur J Neurosci. 37(9), 1404-12. Förster (2014) Neuroscience, 269, 102-11.

Kategorie: Poster

Poster 46:

Titel:Holoprosencephaly with cyclopia – case presentation

Autoren: Frandes C.(1),Clock Moore J.(2),Radu A.(3),

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Abstract:
Cyclopia is a congenital malformation of the face characterized by the fusion on the midline of the 2 orbits of the eye, resulting in a single orbit. The eye ball may be absent, other times rudimentary, apparently normal or duplicated. The nose can be nonexistent or substituted by a tubular proboscis appendix, situated on the superior part of the orbit. Cyclopia represents the extreme form of hypotelorism being the most serious form of facial malformation of all malformative spectrum with a very rare incidence of 1/100.000 births. Holoprosencephaly is a serious developmental disorder (HPE) of the cephalic pole where the prosencephalon (forebrain of the embryo) fails to separate into two cerebral hemispheres during the 5th-6th week of pregnancy in humans. The present case is that of a 22 week male fetus, weighing 1000 grams, plurimalformed from a diabetic parturient. The cyclopia shocks from the first inspection with arinia and proboscis,synotia. During the necroptic examinations we found a cerebral substance with a flaccid immature aspect, with a presence of a cystic occipital intracranial formation .The fetus presents bilateral hypoplasia, atelectatic lung, the heart presents hypoplasia of the left ventricle and dilatation of the right atrium with a common arterial trunk with an orifice in the left ventricle. Also the fetus presents hepatomegaly, liver stasis and ascites with 50 ml serous citrine fluid. The placenta and the umbilical cord were examined macroscopically and microscopically that brought valuable information regarding vascular changes that led to hypoxia. Key words: congenital malformation, cyclopia, feto-placental unit.

Kategorie: Poster

Poster 47:

Titel:Starvation-induced effects on brain plasticity in the activity-based anorexia rat model

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Abstract:
Anorexia nervosa (AN) is an eating disorder characterized by self-imposed starvation, a disturbed production of gonadal steroid hormones and often accompanied by excessive exercise. Activity-based anorexia (ABA) is an animal model which represents many aspects of this psychiatric illness including reduced food intake, weight loss, amenorrhea and hyperactivity. We used different modifications of this model to analyze its consequence on the starvation-induced alterations of brain plasticity in the cerebral cortex and hippocampus. Adolescent Wistar rats had 24h/day running wheel access and received 40% of their baseline daily food intake until a 15%, 20% or 25% weight reduction was reached; body weight was then maintained. Furthermore, different ages of the rats (4-8 weeks) and length of starvation (2-4 weeks) were varied. Running wheel activity, menstrual cycle and brain volume after sacrifice where analyzed as outcome parameters. After a 20% weight reduction the ABA rats showed the greatest voluntary increase in running wheel activity compared to normal weight control rats. An irregular cycle was found in the 20% and 25% weight reduction group. The other groups and brain volumes are currently being analyzed and results presented. Whole brain atrophy is detected in AN patients, therefore we expect a reduction in the volume of the grey matter in ABA animals especially in hippocampus and cortex accompanied by selective synapse loss. The interaction of extend of starvation, length of starvation, animal age and menstrual cycle will be analyzed. We hypothesize a potential role of estrogen in this trophic process as a potential cause.

Kategorie: Poster

Poster 48:

Titel:Expression and activity of temperature-sensitive transient receptor potential channels (thermo-trps) in human pterygium cells

Autoren: Garreis F.(1),Mergler S.(2),Schröder A.(1),Zoll S.(2),Khajavi N.(2),Lucius A.(2),Straßenburg M.(2),Lude A.(2),Paulsen F.(1),

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Abstract:
A pterygium is a benign fibrovascular lesion with an appearance of triangular or wing-shaped over-growth of the cornea. It is associated with ocular surface inflammation, tearing, astigmatism and impairment of vision. The exact pathogenesis is still unknown. Ca2+ permeable temperature-sensitive transient receptor potential channels (thermo-TRPs) play an important role in regulation of calcium homoeostasis as well as various cell biological functions such as cell growth and cell migration. Therefore, we studied the expression and activity of thermo-TRPs in pterygium. First, we characterized a spontaneously immortalized pterygium cell line by different biomarkers for pterygium, limbal stem cells, corneal and conjunctival epithelial cells by means of RT-PCR, Western blot and immunofluorescence analysis. Cultivated human corneal (HCE) and conjunctival epithelial (HCjE) cell lines as well as primary pterygium cells from surgical removal served as controls. Additionally, we analyzed expression and calcium regulation through thermo-TRPs by measurements of intracellular free Ca2+ with using fluorescence calcium imaging (fura-2). The underlying whole-cell currents were measured using the planar patch-clamp technique. RT-PCR and Western blot analysis revealed expression of pterygium biomarkers in the pterygium cell line. Our study revealed expression of thermo-TRPs in immortalized pterygium cell line and in cultivated primary pterygium cells from patients. Immunohistochemistry verified thermo-TRP expression in paraffin-embedded section from pterygia. Ca2+ imaging and analysis of whole-cell currents indicated functional expression of the heat sensor TRPV1 (capsaicin receptor) and also of the cold sensor TRPM8 (menthol receptor) in pterygium cells. Thermo-TRPs are expressed in pterygia and reveal an altered functional activity of TRPV1 and TRPM8. This finding may provide a future target for pharmacological intervention of pterygium.

Kategorie: Poster

Poster 49:

Titel:Estrogen dependent expression of estrogen receptor beta and sex hormone binding globulin in rat phaeochromocytoma cell line pc 12.

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Abstract:
PC12 cells are derived from a rat pheochromocytoma. This cell line is known to develop neuronal features upon treatment with Nerve growth factor NGF. These cells express in part estrogen receptors (ER-alpha Recently we observed expression of sex hormone binding globulin (SHBG) in PC12 cells. Estrogens promote development of these cells and excert neuroprotective effects. Here we treated NGF differentiated PC 12 cells with physiological concentrations of 17-beta-estradiol (E2) and with the anti-estrogen Tamoxifen. With immunocytochemistry we observed mostly nuclear staining for ER-beta and cytoplasmic staining for SHBG in a portion of these neuron like cells. With RT-PCR we detected ER-beta and SHBG encoding transcripts indicating intrinsic expression of both steroid binding proteins. Numbers of immunostained cells and their staining intensity was increased after treatment with E2 indicating stimulation of biosynthesis. This effect could not be inhibited with Tamoxifen. Our findings suggest that estrogen dependent expression of ER-beta and of SHBG may in part be independent from classical nuclear steroid receptors, perhaps mediated through membrane actions of the ovarian steroid hormone

Kategorie: Poster

Poster 50:

Titel:Vascular units in the human thumb pad

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Abstract:
Classical descriptions and all textbooks describe the arteries of the skin as organised in two horizontal plexus: a profound plexus at the dermal/hypodermal border, and a superficial plexus in the papillary dermis. Both plexus are connected by vessels ascending through the reticular dermis. Our presentation challenges this view and proposes a new concept of “dermal vascular units” instead of a superficial arterial plexus. We examined the skin of 15 thumb pads of body donators aged between 60 and 93 years. Using High-resolution episcopic microscopy (HREM) we created digital volume of skin segments of 2739 x 2054 x 3000 micron3. Voxel sizes were 1.07 x 1.07 x 2 micron3. The HREM data were analysed using virtual re-section tools and virtual three-dimensional (3D) surface rendered models. In all specimens the dermal arteries of the thumb pads were organised as discrete vessel trees. Relatively large arteries arose from the profound plexus and entered the dermis. They ascended through the dermis and ramified in a tree like manner. Each single artery tree supplied blood almost exclusively to an area of the papillary dermis of 0.77-1.88 mm2. Occasionally the branches of one tree and that of neighbouring trees were connected by arterio-arterial anastomoses (total of 0 to 8 within the analysed volumes). No specimen showed a superficial arterial plexus. Thus, at least for the skin of the thumb pad, we propose the existence of “arterial units”. These units represent skin zones, to which blood is almost exclusively supplied by a single dermal artery.

Kategorie: Poster

Poster 51:

Titel:Ultrastructural analysis of ectopic lymphoid organs in mp4-induced experimental autoimmune encephalomyelitis

Autoren: Grether N.(1),Kuerten S.(1),

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Abstract:
Recent evidence suggests that B cells play a crucial role in the pathogenesis of multiple sclerosis (MS). In particular B cells were shown to aggregate in the meninges of patients with secondary progressive MS and this aggregation was associated with more severe clinical and histological disease. In particular, it was suggested that B cell aggregates produce soluble factors that induce neurodegeneration in adjacent tissue. However, this concept has remained highly controversial. We have previously established MP4-induced experimental autoimmune encephalomyelitis (EAE) in C57BL/6 mice to model the pathology of MS and we were able to show that the formation of B cell aggregates and tertiary lymphoid organs (TLO) in the CNS was also a characteristic feature of the MP4 model. Here we set out to study the ultrastructure of TLO in the brains of MP4-immunized mice. To this end, semi- and ultra-thin sections were obtained from the brains, lymph nodes, spleens and Peyer’s patches of MP4-immunized mice 60 days after disease onset. Transmission electron microscopy was used to analyze the morphological composition of TLO as compared to diffuse B cell infiltrates and secondary lymphatic organs. Further, we evaluated TLO-associated degeneration of myelin and axons. Our results demonstrate that TLO resemble secondary lymphoid tissue, but are also characterized by unique TLO-specific morphological features. In addition, our results confirm the notion that TLO are directly involved in the degeneration of the CNS.

Kategorie: Poster

Poster 52:

Titel:New serotonergic pathway regulating neuronal morphology and functions via adhesion molecule l1

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Abstract:
Serotonin (5-HT) is an important neurotransmitter regulating a wide range of physiological and pathological functions including many aspects of neural development. Serotonin operates via the activation of multiple 5-HT receptors, whereby in the present study we focused on the 5-HT4 receptor (5-HT4R). In the mammalian brain this receptor contributes to the regulation of learning and long term memory and is involved in various central and peripheral disorders, including neurodegenerative disease and depression. The 5-HT4R stimulation results in the activation of the small GTPase RhoA, leading to cell rounding and neurite retraction. Here we have demonstrated that this effect can be mediated by phosphorylation of cofilin, important mediator of the temporal and spatial control of actin filament organization. The neuronal adhesion molecule L1 is critically involved in axonal development and can contribute to stress-related disorders in humans. Noteworthy, L1-mediated neurite outgrowth is regulated by cofilin phosphorylation. Thus, cofilin may represent a common downstream effector for both 5-HT4R and L1. In present study we have shown that neuronal L1 can be proteolytically cleaved by the matrix metalloproteinase-9 (MMP-9). Interestingly that stimulation of 5-HT4R induces the release of enzymatically active MMP-9 from hippocampal neurons. Moreover, 5-HT4R and L1 are tightly co-localized at the synapses. Taken together, our results demonstrate that 5-HT4R might regulate L1 shedding in an MMP-9-dependent manner, and can thus represent a novel molecular mechanism by which serotonin can regulate the formation and plasticity of neuronal networks. From these investigations we hope to identify novel targets for pharmacological intervention into stress-related disorders such as depression.

Kategorie: Poster

Poster 53:

Titel:Persistence of thalamocortical input in the absence of cortical layers in the reeler mouse

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Abstract:
Rodents possess a set of facial vibrissae on each side of their snout, which they use for tactile perception. Layer 4 of the posteromedial barrel subfield of the primary somatosensory area of rodent is home to the barrel field, where facial vibrissae are represented as a dense cluster of cells called barrel, neurons contained within each barrel being primarily responsive to stimulation of the corresponding vibrissae. In the reeler mouse, a model of disturbed cortical development characterized by a loss of cortical lamination, the barrel field exists in a distorted manner. Little is known about the incidence of the loss of lamination on the functional connectivity of the barrel field in this model. It is especially unclear whether thalamocortical fibers manage to find their target cells in ectopic positions and faithfully report sensory experience from the periphery to the cortex. We investigated this question by combining in vitro whole cell recordings of identified layer 4 neurons in wild type animals and their equivalents in reeler with specific, channelrhodopsin-mediated optogenetic manipulation of thalamocortical input from the ventral posterior medial nucleus of the thalamus. Laser stimulation of thalamocortical fibers in the cortex reliably evoked short latency EPSPs in their postsynaptic targets that differed little between both strains, indicating that the absence of cortical lamination in the reeler mouse does not prevent the development of an orderly thalamic input to the somatosensory cortex.

Kategorie: Poster

Poster 54:

Titel:Case report: origin of the ascending pharyngeal artery from the cervical segment of the inner carotid artery

Autoren: Haenssgen K.(1),Herrmann G.(1),

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Abstract:
We report the case of a variant origin of the ascending pharyngeal artery from the cervical segment of the inner carotid artery in a 73-year-old male found during the dissection course for medical students. We demonstrated that no arterial branch that meets the criteria of the ascending pharyngeal artery originated from the external carotid artery. The artery identified as ascending pharyngeal artery arose from the inner carotid artery and bifurcated into an anterior and posterior trunk. The anterior trunk provided branches to the pharyngeal and prevertebral muscles, to the auditory tube and to the foramen lacerum. Branches from the posterior branch reached the jugular foramen and the hypoglossal canal. As an additional finding we report the bilateral presence of an elongated styloid process of about 4 cm length.

Kategorie: Poster

Poster 55:

Titel:Autism-associated shank proteins in developing hippocampal neurons

Autoren: Halbedl S.(1),Schoen M.(1),Boeckers T.(1),Schmeisser M.(1),

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Abstract:
Autism spectrum disorder (ASD) is a neurodevelopmental disorder with two major phenotypes: impairment in reciprocal interaction and communication as well as a stereotyped and restricted behavior pattern. Shank1, Shank2 and Shank3 are essential scaffold proteins of the postsynaptic density (PSD) of excitatory glutamatergic synapses. Within the PSD, Shank proteins multimerize and build large molecular platforms thus providing multiple protein-protein-interaction sites, thereby linking postsynaptic receptors with their downstream signaling proteins and the actin cytoskeleton of dendritic spines. Over the last decade, mutations in those genes were found to play a central role in the pathogenesis of neuropsychiatric disease, predominantly ASD. Interestingly, two studies have already implicated a role of Shanks in early development of primary hippocampal neurons by revealing Shank2 and Shank3 immunoreactivity in growth cones. For a more detailed analysis of Shanks in early neuronal development, we started to examine hippocampal neurons at distinct early developmental stages. So far we could show that all Shanks are indeed found in early hippocampal neurons and that they exhibit interesting expression dynamics and subcellular localizations over time, strongly supporting a novel role in early neuronal development compared to their well-known function during the formation of postsynaptic specializations. We are now using different in vitro and in vivo model systems to elucidate the role of these proteins in early neuronal differentiation.

Kategorie: Poster

Poster 56:

Titel:How do cells contribute to tendon and ligament biomechanics?

Autoren:Hammer N.(1),Huster D.(2),Sebastian F.(3),Hädrich C.(4),Koch H.(5),Schmidt P.(2),Sichting F.(6),Wagner M.(3),Boldt A.(5),

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Abstract:
Introduction: Acellular scaffolds are increasingly used for the surgical repair of tendon injury and ligament tears. Very little data exist that directly compares acellular scaffolds and their native counterparts mechanically and histologically. Such a comparison would help estimate the influence of cellular components in ligament and tendon stability and give insight into the effects of acellularization on collagen structures. Material and Methods: Eighteen human iliotibial tract samples were obtained from nine body donors. Nine samples were acellularized with sodium dodecyl sulphate (SDS), while nine counterparts from the same donors remained in the native condition. The ends of all samples were plastinated to minimize material slippage. Their water content was adjusted to 69%, using the osmotic stress technique. Uniaxial tensile testing was performed to obtain the elastic modulus, ultimate stress and maximum strain. The effectiveness of the acellularization procedure was histologically verified by means of a DNA assay. Results: The histology samples showed a complete removal of the cellular components and an extensive removal of the DNA content. Tensile properties of the tract samples were unaffected by acellularization with the exception of maximum strain. Discussion: The data indicate that cells only have negligible influence on mechanical properties of ligaments and tendons in vitro. Moreover, acellularization with SDS alters material properties to a minor extent, indicating that this method provides a biomechanical match in ligament and tendon reconstruction. However, the given protocol insufficiently removes DNA to the potential effect of transplant rejection when acellular tract scaffolds are used in soft tissue repair.

Kategorie: Poster

Poster 57:

Titel:Pelvic belt effects on pelvic morphometry, muscle activity and body balance in patients with sacroiliac joint dysfunction

Autoren:Hammer N.(1),Soisson O.(1),Hammer K.(2),Sichting F.(3),Josten C.(4),Milani T.(3),

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Abstract:
Introduction: The sacroiliac joint (SIJ) is frequently involved in low back and pelvic girdle pain. However, morphometrical and functional characteristics related to SIJ pain are poorly defined. Pelvic belts represent one treatment option, but evidence still lacks as to their pain-reducing effects and the mechanisms involved. Addressing these two issues, this case-controlled study compares morphometric, functional and clinical data in SIJ patients and healthy controls and evaluates the effects of pelvic belts. Methods: Morphometric and functional data pertaining to pelvic belt effects were compared in 17 SIJ patients and 17 controls. Lumbar spine and pelvis morphometries were obtained from 3T magnetic resonance imaging. Functional electromyography data of pelvis and leg muscles and center of pressure excursions were measured in one-leg stance. The numerical rating scale was used to evaluate pain-reducing effects. Results: Pelvic belts decrease pain intensity in SIJ patients. Pelvic morphometry is largely unaltered by SIJ pain and by pelvic belt application except for the angle of lumbar lateral flexion. Biceps femoris activity is higher and rectus femoris activity tends to be higher in patients. Belt application decreases biceps femoris activity but increases gluteus maximus activity in patients, as compared to controls. Center of pressure is unaltered by SIJ pain or by pelvic belt application. Discussion: SIJ pain is related to an altered horizontal alignment of the lumbar spine and to altered muscle activity. Pain-decreasing effects of pelvic belts are potentially related to altered muscle activity, but less likely to pelvic morphometry or body balance in one-leg stance.

Kategorie: Poster

Poster 58:

Titel:In vitro investigation of cxcr4 and cxcr7 endocytosis upon stimulation with novel peptidic ligands

Autoren Hattermann K.(1), Schottelius(2), Becker(1), Schröter(1), Gebhardt(1), Wester(2), Mentlein(1),

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Abstract:
Based on the important functional role of the chemokine receptor CXCR4 in tumor growth, tumor progression and metastasis and its overexpression in numerous tumors, a variety of CXCR4-directed therapeutics and imaging probes have recently been developed, among them several peptidic high-affinity CXCR4-ligands. [68Ga]pentixafor has already entered clinical application as an excellent PET imaging probe for the quantitative detection of CXCR4 expression in vivo. Since especially in the context of CXCR4-targeted therapies a detailed understanding of the cellular processes triggered by receptor binding of a given ligand is indispensable, we investigated the effect of [Ga]pentixafor and three other peptidic CXCR4-ligands on receptor internalization. Experiments were performed in cells expressing CXCR4 only (SH-NSH, neuroblastoma) and in cells coexpressing CXCR4 and CXCR7 (MCF-7, breast carcinoma) to investigate the extent of CXCR4-mediated co-endocytosis of CXCR7. Living cells were immunolabeled for CXCR4/CXCR7, stimulated with the different synthetic CXCR4 ligands and CXCL12 (CXCR4/CXCR7) or CXCL11 (CXCR7) as positive controls, and receptor internalization was monitored by fluorescence microscopy. Data in SH-NSH cells showed efficient induction of CXCR4 endocytosis by all ligands except CXCL11. In MCF-7 cells, all compounds triggered co-internalization of CXCR4 and CXCR7, independently of their documented receptor selectivity (CXCL11: CXCR7-selective, [natGa]pentixafor: CXCR4-selective). Further studies investigating the (conjoint) role of CXCR4 and/or CXCR7 activation by the compounds in this study on other processes such as escape from apoptosis, proliferation etc. are currently underway.

Kategorie: Poster

Poster 59:

Titel:Lysine mutants of fibroblast growth factor receptor 1 induce elongative axon growth

Autoren: Hausott B.(1),Förste A.(1),Mangger S.(1),Zach F.(1),Klimaschewski L.(1),

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Abstract:
The fibroblast growth factors (FGFs) promote axon growth during development and regeneration of the nervous system. Ligand-induced activation of FGF receptors (FGFRs) is followed by endocytosis and degradation in lysosomes. Alternatively, receptors may be recycled back to the plasma membrane. Among the four FGFRs, FGFR1, -2 and -3 are mainly sorted to lysosomes for degradation, whereas FGFR4 is predominantly recycled back to the plasma membrane. We previously reported that overexpression of FGFR1 promotes FGF-2-induced elongative axon growth. This effect is further enhanced by leupeptin, which inhibits degradation of FGFR1 and promotes receptor recycling. In this study we analyzed the effects of FGFR1 mutants with reduced numbers of lysines on axon growth of adult sensory neurons in vitro. The signaling active FGFR1 lysine mutant FGFR1-15R with 14 lysine residues, which is preferentially recycled back to the plasma membrane, promoted elongative axon growth of adult sensory neurons without additional branching. Activation of pERK, pAkt, pSTAT3 and pPLC gamma was not enhanced with mutant FGFR1-15R compared to wild-type FGFR1. Lysine mutant FGFR1-26Ra with three lysine residues and reduced signaling activity and signaling inactive lysine mutant FGFR1-29R without lysine residues had no effect on axon growth. Our results strongly imply that lysine mutant FGFR1-15R with 14 lysines and enhanced recycling capabilities promotes elongative axon growth of adult sensory neurons without additional branching. However, the activation of pERK, pAkt, pSTAT3 and pPLC gamma was not enhanced compared to wild-type FGFR1. Thus, the underlying mechanisms of enhanced recycling of FGFR1 on axon elongation need to be identified.

Kategorie: Poster

Poster 60:

Titel:Targeting the tumor ecm as auxiliary treatment to increase therapeutic response.

Autoren: Henke E.(1), Roehrig F.(2), Hoffmann(1), Vorlova(3), Wartenberg(4), Gaetzner(5), Rosenwald(4), Granot(6), Ergün S.(7),

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Abstract:
During tumor formation the tumor cells do not only proliferate, but also form their own microenvironment. The newly established microenvironment not only supports further tumor growth, but also protects the tumor cells from the effects of therapeutic agents. An important part of the tumor microenvironment is the extracellular matrix (ECM). Besides providing structural support, the ECM is also directly involved in regulating cell behavior like motility and invasiveness. Lysyl oxidases are a family of enzymes that catalyze the cross linking of proximal fibrous protein strands, consequently increasing the tissue’s rigidity. We demonstrated recently that crosslinking catalyzed by lysyl oxidases also increases the physical barrier function of ECM proteins. Lysyl oxidase activity reduces interstitial diffusion, thereby protecting tumor cells from exposure to drugs. Inhibition of lysyl oxidases can improve drug transport within the tumor and dramatically enhance treatment efficacy. Furthermore, lysyl oxidase inhibition reduced build-up of fibrous matrix, dramatically changed the morphology of the microenvironment and altered infiltration of stromal cell populations. This was most prominently observed in the treatment of metastatic lesion that remained in an immature, non-vascularized state, more vulnerable to cytotoxic treatment. Our results demonstrate that ECM-modifying enzymes like lysyl oxidases play an important role in tumorigenesis and tumor progression. They are key regulators controlling morphology, and physical properties of the forming tissue and influencing cellular behavior and therapeutic response. Interference with these enzymes has the potential to improve the effectiveness of many if not all therapeutics at our disposal for the treatment of malignant diseases.

Kategorie: Poster

Poster 61:

Titel:Perforasomes of the anterior knee region

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Abstract:
Introduction In reconstructive surgery, skin and muscle flaps are raised on the basis of their blood supply. Various perforasomes of different regions (e.g. arm, abdomen) have already been described in literature, however, information concerning perforasomes of the anterior knee region is scarce. Therefor, the aim of this study was to describe the individual vascular supply and position of pediculated perforator flaps in the anterior knee region. Material and methods Twenty lower extremities of fresh frozen specimen donated to the anatomic institute were obtained. After identifying the femoral artery in the middle third of the thigh, 10 ml methylene blue was injected to facilitate the dissection of the different branches. After identification of the different perforators, a cannula was inserted into each perforator and injected with alternating colored solutions to color the appendant perforasome. The width, length, position in relation to the middle of the patella, the diameter of the supplying artery and the diameter of the leg were measured. Every perforasome was recorded photographically. Results A total of 122 perforasomes were found in 20 legs, there were 6,1 perforasomes per leg in average. The perforasomes measured 7,45 ± 3,42 cm in length, 7,18 ± 2,92 cm in width and the average perforator diameter was 1,52 ± 0,55 mm. Most similarities were found in the joint region. Conclusion A highly variable arrangement of the different perforasomes in the anterior knee region was observed. Especially at the level of the knee joint a relatively constant size and localization of perforasomes was observed. This information could be helpful in planning reconstructive surgery in this region.

Kategorie: Poster

Poster 62:

Titel:Inside into the 3d-trabecular architecture of the human patella

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Abstract:
The subchondral bone plate (SBP) is a dynamic component with functional adaptation to long-term-loading. Since the force within a joint is transmitted through the SBP into the trabecular system, we describe the architecture and regional variety of the trabecular network of the human patella in respect to the load transmitted onto it. Samples were CT-scanned for CT-osteoabsorptiometry (CT-OAM) and for trabecular analysis (phoenix-nanotom®). CT-OAM was used to visualize density distribution of the SBP, VGStudio® and CT-analyser for structural analysis of the trabecular bone (Fig.1). Obtained parameters: bone-volume-fraction (BV/TV); trabecular-number (Tb.N); trabecular-thickness (Tb.Th); trabecular-separation (Tb.Sp); structure-model-index (SMI). The parameters varied throughout the articular surface and the trabecular bone beneath. The distribution was distinctive with maxima of material and high stability below areas of highest load intake. With increasing depth, the pattern was persistent but lessened in intensity. BV/TV, Tb.N, and Tb.Th decreased with depth, Tb.Sp and SMI increased (Fig.2). The correlation of density distribution and BV/TV (r2=0.81); Tb.N (r2=0.88); Tb.Th (r2=0.79); Tb.Sp (r2=-0.76); and SMI (r2=-0.75) was significant ($p<0.01$). The development of the parameters into depth shows logarithmic dependencies. The trabecular network, in its function to support the SBP, adapts to its needs and is therefore not homogenous in architecture. According to the intake of long term load, the trabecular structure remodels in a way to optimise the support. The density distribution of the SBP correlates significantly with the structural and numerical parameters of the trabecular bone as both can be seen as functional unit.

Kategorie: Poster

Poster 63:

Titel:Anatomical-coloproctological skills lab

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Abstract:
Anatomical-coloproctological skills lab Summary Background Profound anatomical knowledge is mandatory for coloproctologists. We established a training concept for young surgeons consisting of an anatomical and surgical skills lab as part of a coloproctological training course. The aim is to apply anatomical skills to surgical approaches within a training curriculum, and to offer workstations for implementing new techniques in coloproctology. Methods The 2-day training course comprises a gross anatomy course using preserved pelvic specimens for compartmental dissection of the pelvic floor. Lectures on embryological development and systematic and topographical anatomy of the pelvic floor precede the handson training in the wet lab. On day 2, the participants are trained in specific coloproctological techniques at four dummy workstations in a step-by-step approach by experienced coloproctologists. Results The participants benefit from the direct application of their anatomical skills to specific surgical questions. Conclusions Skills labs support surgical training concepts and are proposed to be integrated in postdoctoral educational curricula. Anatomical basics are mandatory for coloproctological approaches and implementing new techniques into clinical routine. Proper mentorship is the foundation for training quality surgeons.

Kategorie: Poster

Poster 64:

Titel:Anti-dppx encephalitis: a novel autoimmune pathomechanism

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Abstract:
Autoimmunity in the CNS has gained a lot of attention during the recent years. Besides targeting intracellular structures regarded as a secondary phenomenon due to exposure of antigenic structures following neuronal degeneration, surface proteins have also been detected as target structures. Amongst them is the NMDA receptor 1 or, more recently, dipeptidyl peptidases-like proteins (DPPX). DPPX represents a regulatory subunit of voltage gated potassium channels of the Kv4.2 and Kv4.3 subtype. We here report about several patients that express high titers of anti-DPPX antibodies in the serum. These patients suffer from severe neurological symptoms such as orientation problems, walking difficulties and resting tremor. Often, these symptoms are preceeded by a heavy body weight loss due to massive diarrhea. By applying immunohistological methods we could show that incubation of brain or gut sections from different animal species result in a strong staining pattern of synaptic or perisynaptic neuronal structures. Biochemical studies revealed that incubation of cultivated hippocampal neurons with patient serum results in a down regulation of DPPX from neuronal membranes likely affecting Kv4.2/3 action. Moreover, neuroimaging studies showed an increased activity of ENS neurons of the myenteric plexus following incubation with patient serum. Taken together, we here for the first time present (patho-)physiological mechanisms underlying this newly described autoimmune disease termed anti-DPPX encephalitis.

Kategorie: Poster

Poster 65:

Titel:Is the destruction of perineuronal nets around saccadic brainstem neurons the cause of saccadic palsy following cardiac surgery?

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Abstract:
Perineuronal nets (PNs) form a specialized extracellular matrix around certain highly active neurons. Suggested PN functions include stabilization of synaptic contacts, contribution to local ion homeostasis or a protective role. Well-developed PNs are found around neurons of the saccadic network consistent with the neurons' high firing rate. Lesions of burst neurons result in saccade slowing or complete loss. An unusual clinical syndrome exists in which patients awaken following cardiac surgery with a permanent saccadic palsy. The underlying mechanism is unknown. Since PNs are vulnerable to ischemia, and since cardiac operations routinely use cardiopulmonary bypass, we investigated the saccadic brainstem neurons for degeneration and alterations of PNs in a woman (50y), who developed saccadic palsy after aortic valve replacement; all other eye movements remained normal until death. The brain was collected, fixed and paraffin-embedded. Ten µm-thick sections were immunostained for parvalbumin (PAV) to identify excitatory (EBN) and inhibitory saccadic burst neurons (IBN) in the rostral mesencephalon and pontine reticular formation, and omnipause neurons (OPN), which showed no signs of degeneration. Combined PAV- and PN-immunostaining revealed a severe loss or fragmentation of PNs around OPNs and EBNs, but not around IBNs and extraocular motoneurons. We conclude that the saccadic palsy in this patient is due to malfunction of EBNs and OPNs, and propose that their malfunction is due to fragmentation and/or loss of PNs. Eye movement recordings in animals after small injections of PN-degrading chondroitinase ABC in saccade neuron areas may provide an experimental model to study effects of PN damage.

Kategorie: Poster

Poster 66:

Titel:Does lpp1 influence the immune system? Characterizing its effect in postnatal lpp1 overexpressing mice.

Autoren: Hübner A.(1),Brindley D.(2),Tigyi G.(3),Brandt C.(1),Bräuer A.(1),

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Abstract:
The role of Lipid Phosphat Phosphatase 1 (LPP1) in adult mice is well investigated. It is a member of the Lipid Phosphatases/Phosphotransferases (LPT) superfamily. As a transmembrane ectoenzyme it dephosphorylates bioactive lipids such as LPA (Lysophosphatidic acid) and Sphingosine-1-phosphate (S1P). In addition LPP1 controls the signaling downstream of LPA and S1P receptors. Thereby it influences processes as proliferation, migration and survival of cells leading to a suppression of inflammations and the growth of tumors. However little is known about the effects of this phosphatase in postnatal mice, especially in their immune system. LPA and S1P influence for example chemokinesis of different immune cells. We have compared mice with LPP1 overexpression to their wildtype on the morphological, cellular and molecular level. We started with examining the phenotype of the animals and the spleen, followed by immunohistochemistry of the organ and flow cytometry of its cell amounts. Thereby we found considerable differences among the body parameters and subpopulations of immune cells between wildtype and transgenic animals. Completing we analyzed the expression of five different groups of receptors and modulators in lipid signaling pathways in two types of immune cells, namely CD8alpha+ T and CD45R+ B cells. We found interesting differences in gene expression whereby PRG5 expression is especially outstanding.

Kategorie: Poster

Poster 67:

Titel:Sex differences in quadriceps muscle and femoral bone cross sectional areas in adolescent and mature volleyball athletes

Autoren: Hudelmaier M.(1),Boeth H.(2),Diederichs G.(3),Cotofana S.(1),Wirth W.(1),Hofmann-Amtenbrink M.(4),Duda G.(2),Eckstein F.(1),

Adressen:(1)Institute of Anatomy|Paracelsus Medical University|Salzburg|Austria; email:martin.hudelmaier@pmu.ac.at; (2)Julius Wolff Institute for Biomechanics and Musculoskeletal Regeneration|Charité - Universitätsmedizin Berlin|Berlin|Germany; (3)Institut für Radiologie|Charité - Universitätsmedizin Berlin|Berlin|Germany; (4)Mat Search Consulting Hofmann|Mat Search Consulting Hofmann|Pully|Switzerland

Abstract:
Purpose: Recent findings indicate a relationship between muscle and incident or progressive symptoms of osteoarthritis in women but not in men. Little is known about sex differences of muscle development during aging, particularly in relation to local bone size. Methods: 20 young (baseline age: 16.0Â±0.6y) and 20 mature (46.3Â±4.7y) athletes were studied (10 of either sex in each group). Axial MR images (T1-weighed spin echo) of both thighs were acquired at baseline and 2 years. Quadriceps, total femoral and cortical bone CSAs was determined in the dominant leg. Differences between groups were explored using unpaired t-tests, and longitudinal difference using paired t-tests. Results: Men had at baseline greater quadriceps and femoral bone CSAs than women ($p<0.001$). Mature women had smaller quadriceps ACSAs than adolescent ones ($p<0.05$). The ratio of quadriceps versus femoral bone area was smaller in mature than in adolescent athletes ($p<0.05$). No significant changes in quadriceps CSA were observed during the 2 year observation period. Conclusions: Although men had larger quadriceps and bone CSAs than women, the ratio between muscle and bone tissue did not display sex-specific differences at either stage of maturity. The cross sectional results suggests that in adulthood approximately 92% of the muscle mass of young men, and approx. 88% of that of young women, can be maintained when regular sportive activity is continued.

Kategorie: Poster

Poster 68:

Titel:Contribution of desmosomal adhesion to migration and invasion of epithelial cancer cells

Autoren: Hütz K.(1),Waschke J.(1),Spindler V.(1),

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Abstract:
Cell-cell adhesion is essential for the integrity and maintenance of multicellular tissues and is misregulated in a variety of cancer types. Desmosomes are intercellular junctions that mediate strong adhesion between cells in epithelial and some non-epithelial tissues. Besides their adhesive function, they play important roles in the regulation of different signaling pathways. Several reports demonstrated that desmosomal proteins are abnormally expressed in different cancers. In our present work we investigated the tumorigenic role of the desmosomal cadherin-type adhesion molecule desmoglein 2 (Dsg2) in two epithelial cancer cell lines. We used the AsPC-1 cell line derived from a pancreatic adenocarcinoma and the AGS cell line isolated from a diffuse gastric adenocarcinoma. SiRNA-mediated silencing of Dsg2 resulted in reduced cell cohesion and faster cell migration which was detected by a monolayer wounding approach. Since we did not observe changes in the amount of Ki67 or phosphorylated histone H3, we assume that the effects of Dsg2 silencing on cell migration and invasion are independent of cell proliferation. In another approach to investigate desmosomal function in cancer cells we directly inhibited desmosomal adhesion through single peptide (SP), which was designed to block Dsg binding. Similar to Dsg2 knockdown, SP treatment resulted in increased migration in AsPC-1 cells. Furthermore, invasion through extracellular matrix was enhanced by SP treatment, as determined by a modified Boyden chamber assay. These data demonstrate a contribution of Dsg2 function to tumorigenic behavior of epithelial cancer cells.

Kategorie: Poster

Poster 69:

Titel:Cd11c-positive cells from brain, spleen, lung, and liver exhibit site-specific immune phenotypes and plastically adapt to new environments

Autoren: Immig K.(1),Gericke M.(1),Krüger M.(1),Menzel F.(1),Merz F.(1),Schiefenhövel F.(1),Hanisch U.(2),Wendeburg L.(3),Biber K.(3),Bechmann I.(4),

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Abstract:
The brain’s immune privilege has been attributed to the lack of dendritic cells (DCs) within its parenchyma and the adjacent meninges, which implies the maintenance of antigens than their presentation in lymphoid organs. Using mice transcribing the green fluorescent protein under the promoter of the DC marker CD11c, we identified a juxtavascular population of cells expressing CD11c. We now phenotypically compared this population with CD11c+/CD45+-cells from lung, liver and spleen in healthy mice using 7-color flow cytometry. We identified unique, site-specific expression patterns of DCs reflecting the common markers F4/80, CD80, CD86, CX3CR1, CCR2, FLT3, CD103 and MHC-II. Further, we observed the two known CD45+-populations (CD45high and CD45int) in the brain, whereas liver, lung and spleen exhibited a homogeneous CD45high population. Most importantly, compared to spleen and liver, CD11c+-cells from the brain almost completely lacked MHC-II expression and CD45high/CD11c+-cells from the brain have a lower percentage of MHC-II+-cells. In order to test whether phenotypical differences are fixed by origin or develop due to environmental factors, we transplanted brain and spleen mononuclear cells on organotypic slice cultures from brain (OHSC) and spleen (OSSC). We demonstrate that ramification of MHC-II+-splenocytes is paralleled by down-regulation of MHC-II while brain-derived mononuclear cells neither ramified nor up-regulated MHC-II in OSSCs. Thus, brain-derived mononuclear cells maintain their MHC-II- phenotype within the environment of an immune organ. Further, our data confirm the view that intraparenchymal CD11c+-cells share established immunophenotypical characteristics of DCs from other organs but remain unique for their low MHC-II expression. DFG FOR 1336

Kategorie: Poster

Poster 70:

Titel:Chagasic megacolon and vip

Autoren: Jabari S.(1),de Oliveira E.(2),Brehmer A.(1),da Silveira A.(3),

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Abstract:
Megacolon, the irreversible dilation of a colonic segment, is a structural sign associated with various gastrointestinal disorders. In its hereditary, secondary form (e.g. in Hirschsprung's disease), dilation occurs in an originally healthy colonic segment due to an annally located, aganglionic zone. In contrast, in chronic Chagas' disease, the dilated segment itself displays pathohistological changes, the earliest and most prominent being found was massive loss of myenteric neurons. This neuron loss was partial and selective, i.e. some neurons containing neuronal nitric oxide synthase and/or vasoactive intestinal peptide (VIP) were spared from neuron death. This disproportionate survival of inhibitory neurons, however, did not completely correlate with the calibre change along the surgically removed, megacolonic segments. A better correlation was observed as to potentially contractile muscle tissue elements and the interstitial cells of Cajal. Therefore, the decreased densities of α-smooth muscle actin- and c-kit-immunoreactive profiles were estimated along resected megacolonic segments. Their lowest values were observed in the megacolonic zones itself whereas less pronounced decreases were found in the non-dilated, transitional zones (oral and anal to dilation). In contrast to the myenteric plexus, the submucosal plexus displayed only a moderate neuron loss. Neurons co-immunoreactive for VIP and calretinin survived disproportionately. As a consequence, these neurons may have contributed to maintain the epithelial barrier and allowed the chagasic patients to survive for decades, despite their severe disturbance of colonic motility. Due to its neuroprotective and neuroeffectory functions, VIP may play a key role in the development and duration of chagasic megacolon.

Kategorie: Poster

Poster 71:

Titel:Computational neuroanatomy of the dentate gyrus: biologically realistic models of compartment-specific changes in synaptic inhibition

Autoren:Jedlicka P.(1),Schwarzacher S.(2),Deller T.(2),

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Abstract:
Computational neuroanatomy aims at creating anatomically and biophysically realistic models of neurons and neuronal networks, thus relating the structure to the function at subcellular, cellular and network level. Hippocampal network excitability is regulated by complex interactions between excitatory and inhibitory synaptic activity and intrinsic membrane properties of neurons. Here we used computational modeling to explore how compartment-specific (i.e. dendritic and somatic) changes of GABAergic inhibition contribute to the regulation of dentate network excitability. Computer simulations in a large-scale, biophysically realistic and data-driven network model of the dentate gyrus predicted a specific role for perisomatic inhibition in the regulation of paired-pulse responses of dentate granule cells. The model predictions were confirmed by immunohistochemistry and in vivo electrophysiological recordings. Furthermore, based on full morphological reconstructions, we created models of activity-dependent changes of dendritic and perisomatic GABAergic inhibition in dentate granule cells. Our simulations predict that dendritic inhibition is affected by dendritic morphology and is more prone to activity-dependent ionic plasticity as compared to somatic inhibition. These predictions can be tested by assessing synaptic inhibition with chloride imaging, electrophysiology and 2-photon neurotransmitter photolysis.

Kategorie: Poster

Poster 72:

Titel:Neuroinflammation in als –role of the nlrp3 inflammasome

Autoren: Johann S.(1),Heitzer M.(1),Goswami A.(2),Weis J.(2),Troost D.(3),Beyer C.(1),

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Abstract:
Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disease leading to the degeneration of upper and lower motoneurons in the brain and spinal cord. A plethora of genetic and non-genetic risk factors are associated with ALS including exitotoxicity, oxidative stress, and neuroinflammation. The latter mechanism is hallmarked by the appearance of reactive glial cells, such as astrocytes and microglia, and infiltration of peripheral immune cells. Neuroinflammatory processes play an important role in ALS pathogenesis; although their precise contributions remain unclear. Activation of glial cells precedes neurodegeneration and involves morphological adaptations and the synthesis and release of distinct pro-inflammatory cytokines, i.e. IL-1 beta etc. IL-1 beta is an early and strong pro-inflammatory cytokine produced as an inactive precursor. The maturation of IL-1 beta requires the activation of inflammasome complexes that activate inflammatory caspases, including caspase 1. We have analyzed the expression of inflammasome components and IL-1 beta in a mouse model of ALS (hSOD) and in autopsy tissue from the spinal cord of ALS patients. Our study revealed an increased expression of inflammasomes, in particular NLRP3 components and cytokine production, already in an early symptomatic hSOD1 animals. This inflammasome subtype was mainly found in activated glial cells in the ventral horn of the spinal cord. In human ALS patients, NLRP3 components were similarly increased in autopsy tissue of the spinal cord. We conclude that NLRP3 activation is critically involved in ALS pathogenesis and could be an early regulated inflammatory parameter which culminates in neuroinflammatory-mediated cell death of motoneurons in ALS.

Kategorie: Poster

Poster 73:

Titel:Unusually variations of the palmaris longus muscle and an additional muscle belongs to the hypothenar muscles

Autoren: Kalniev M.(1),Krastev N.(1),Dobrev S.(1),Krastev D.(2),Apostolov A.(3),Mileva M.(4),

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Abstract:
During routine dissection in April 2014 in the section hall of the Department of Anatomy and Histology in Medical University - Sofia, Bulgaria we came across very interesting variations of the palmaris longus muscle and an additional muscle belongs to the hypothenar muscles. The cadaveric material was taken in accordance to the ethical principles applying by the Sofia's Medical University. The anatomical variation was photographed using a Nikon Coolpix 995 camera, analyzed and described. Usually the palmaris longus is an inconstant muscle. Concerning literature in 14% of people it is missing. The function of palmaris longus is to tighten the flexor retinaculum. In our case we observed two very interesting variations. The tendon of the palmaris longus was bifurcated forming Y-shaped figure with two parts. It is important to mention that its ulnar part connected with the flexor carpi ulnaris by thin tendinous anastomosis, then turned to the radial part. Two parts finally connected to the palmar aponeurosis. The second variation was too interesting. We observed the additional muscle belongs to the hypothenar muscles. It is originated from the pisiform bone and connected to the flexor retinaculum. This additional muscle was innervated by a small branch of the ulnar nerve and its blood supplying was by a branch of the ulnar artery. This confirms that it belongs to the hypothenar muscles. It is interesting to discuss what was its function and the possibility this additional muscle causing compression to the ulnar nerve and leading to ulnar nerve entrapment in lifetime.

Kategorie: Poster

Poster 74:

Titel:Variation of unusually large number of tendons of extensors on the back of the hand

Autoren: Kalniev M.(1),Krastev N.(1),Krastev D.(2),Apostolov A.(3),Mileva M.(4),Kalniev M.(1),

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Abstract:
During routine dissection in March 2014 in the section hall of the Department of Anatomy and Histology in Medical University - Sofia, Bulgaria we came across a very interesting variation in the presence of unusually large number of extensors on the back of the hand. The cadaveric material was taken in accordance to the ethical principles applying by the Sofia's Medical University. The anatomical variation was photographed using a Nikon Coolpix 995 camera, analyzed and described. Normally there are two tendons towards the index, belongings to extensor indicis and extensor digitorum and two tendons towards the fifth finger, belongings to extensor digiti minimi and extensor digitorum. Towards the third and fourth finger there are only tendons of extensor digitorum. Between the tendons there are intertendinous connections. In our case we observed a very interesting variation. There were two additional bellies that originate from the belly of extensor digitorum heading to the fifth finger. It is important to mention that these bellies were real and these were not intertendinous connections, which usually are observed on the back of the hand. The lateral belly was divided proximally and reached to the fourth finger. The medial belly was divided more distally forming Y-shaped figure with the main belly to the fifth finger. Finally the additional medial belly split into two terminal tendons, reaching to the fourth and fifth fingers. The tendon to the fifth finger was thicker and densely than one to the fourth finger, which was thinner and flat.

Kategorie: Poster

Poster 75:

Titel:Peroxisomes are compromised in idiopathic pulmonary fibrosis - a vicious cycle inducing a higher fibrotic response via tnf-alpha and tgf-beta

Autoren:Karnati S.(1),Oruqaj G.(1),Kotarkonda L.(1),Vijayan V.(1),Zhang W.(2),Shi W.(2),Baumgart-Vogt E.(1),

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Abstract:
Idiopathic pulmonary fibrosis (IPF) is a chronic progressive lethal disease, and its pathogenic mechanisms are not understood. Peroxisomes carry out important metabolic functions by degrading ROS and proinflammatory lipid mediators, and their deficiency induces liver fibrosis. To date, their role in the pathogenesis of IPF has not been investigated. Therefore, we compared peroxisome-related protein and gene expression in lung tissue and isolated lung fibroblasts between human donor and IPF patients. Our results show a significant down-regulation of peroxisomal metabolism and biogenesis, mediated by activated TGF-beta signalling. Further, similar results were also observed in a Bleomycin-induced mouse lung fibrosis model. Moreover, we further explored the altered peroxisomal functions contributing to abnormal fibrosis by dissecting its molecular mechanisms. Cultured human lung fibroblasts treated with the profibrotic factors TGF-beta and TNF-alpha*f*nexhibited a strong Pex13 down-regulation mediated by intact intracellular TGF-beta pathways. In a similar fashion, Pex13 down-regulation by RNAi activated both SMAD-dependent and independent TGF-beta signalling pathways accompanied by increased ROS production and antioxidant enzymes, cytokine elevation (e.g. IL6, TGF-beta) and excessive production of collagen I and III through AP1 and NRF2 activation. In contrast, treatment of fibroblasts with the peroxisome proliferator ¡§Ciprofibrate¡¨ reduced Smad binding element (SBE)-promoter activity of TGF-beta target genes and reduced collagen expression, accompanied by decreased ROS and cytokine production. Taken together, our findings suggest that compromised peroxisome activity plays an important role in IPF progression, possibly by exacerbating pulmonary inflammation and collagen production in the patients.

Kategorie: Poster

Poster 76:

Titel:Detection of the neuroregulatory peptide alarin in cranial autonomic ganglia of the rat and human

Autoren:Kaser-Eichberger A.(1),Trost A.(1),Strohmaier C.(1),Bogner B.(1),Runge C.(1),Kofler B.(2),Reitsamer H.(1),Schroedl F.(3),

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Abstract:
PURPOSE: Alarin is a recently discovered neuroregulatory peptide with vasoconstrictive activity in murine skin. It was lately also detected in rat and human ocular vessels and in human intrinsic choroidal neurons (ICN), therefore involved in autonomic vessel control. Here we ask if alarin is present in extrinsic autonomic sources supplying the eye and explore its impact on ocular innervation. METHODS: Cranial autonomic ganglia of the rat (i.e. superior cervical, SCG; ciliary, CIL; pterygopalatine, PPG; trigeminal, TRI) an human (SCG, PPG, TRI) were prepared for immunohistochemistry against alarin using affinity purified antibodies and established corresponding ganglion markers (SCG: TH; PPG and CIL: ChAT; TRI: SP). For documentation, confocal laser scanning microscopy was used. In rat, quantitative real-time PCR was applied to detect alarin mRNA expression in corresponding ganglia. RESULTS: In rat, weak alarin-like immunoreactivity was detected in neurons of all cranial autonomic ganglia. Those represent only a minority of the overall cell-population in the ganglia investigated: TRI: 8/772; PPG: 4/940; SCG: 18/903; CIL: 11/315. Quantitative real-time PCR was not able to detect a stable alarin mRNA signal in any of the (pooled, n= 4) ganglia. Human SCG, PPG, and TRI were lacking alarin immunoreactivity. CONCLUSION: Since alarin is only present in a minority of neurons of rat cranial autonomic ganglia, and lacking in human SCG, PPG, and TRI, and since we were not able to detect alarin mRNA in rat, we consider it of low impact on extrinsic ocular autonomic innervation, at least under physiological conditions.
Study supported by PMU-FFF (E-11713/068-SRO)

Kategorie: Poster

Poster 77:

Titel:Role of caveolin-1 for serotonin- and muscarine-induced smooth muscle constriction in murine airways

Autoren: Keshavarz M.(1),Jurastow I.(1),Schlenz H.(1),Hartmann P.(1),Wiegand S.(1),Kummer W.(2),Krasteva-Christ G.(2),

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Abstract:
Serotonin (5-HT) and acetylcholine (ACh) can be released from various sources in the lung and are implied in pathogenesis in a mouse asthma-model. We have previously shown that upon depletion of cholesterol the responses to 5-HT and muscarine were reduced in bronchi suggesting an association of 5-HT and muscarinic ACh receptors with caveolins (cav). Here, we investigate the role of cav-1 for 5-HT- and muscarine-induced constriction cav-1-deficient (-/-) and wild-type (+/+) mice. Total response to muscarine (50 nM-50 µM) adapted to KCL (relative reactivity) did not differ between different parts of the extrapulmonary airways. In general, cav-1-/- mice were less sensitive to muscarine at lower doses (10 nM-5 µM) compared to cav-1+/+ mice. No significant difference in the muscarine response (100 nM-100 µM) was found in intrapulmonary bronchi. Total response to 5-HT was dose dependent (10 nM-500 µM) in middle and caudal parts of the trachea and extrapulmonary bronchi with maximal response at 5 µM in cav-1+/+ mice. In cav-1-/- mice, no contractile response was detected in middle and caudal parts of the trachea. Bronchial luminal area decreased in precision-cut lung slices from cav-1-/- and cav-1+/+ mice after stimulation with 5-HT with maximal constriction at 100 µM and 10 µM, respectively. Higher doses than 10 µM 5-HT led to increase in bronchial luminal area that was more pronounced in cav-1-/- bronchi. These results demonstrate an essential role of cav-1 for 5-HT-induced tracheal constriction. In addition, cav-1 plays a modulatory role for muscarine- and 5-HT-induced tracheal and intrapulmonary airway constriction, respectively.

Kategorie: Poster

Poster 78:

Titel:Cavin-1 and cavin-4 in the murine trachea and lung

Autoren: Keshavarz M.(1),Pfeil U.(1),Skill M.(1),Kummer W.(2),Krasteva-Christ G.(2),

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Abstract:
Caveolae are flask-shaped plasma membrane invaginations that modulate intracellular signal transduction. Caveolins (cav-1, -2, and -3) serve as binding partners for receptors and enzymes are essential for caveolae formation. Conserved cytoplasmic family members (cavins, cavin-1 to -4) regulate caveolin assembly into caveolae. Both cav-1 and cavin-1 gene-deficiency causes pulmonary fibrosis. Here, we investigated mRNA expression and protein localization of cavin-1 and -4 in the murine trachea and lung using RT-PCR and single- and double-labelling immunofluorescence. Messenger RNA for cavin-1was detected in tracheal smooth muscle, epithelium and in whole lung homogenates by RT-PCR. Immunofluorescence revealed cavin-1 protein in tracheal and bronchial basal epithelial cells, smooth muscle cells, alveolar macrophages and type 1 alveolar epithelial cells. Cavin-4 mRNA expression was detected in whole lung homogenates and tracheal smooth muscle but not in abraded tracheal epithelium. Immunolabeling of thoracic cross sections revealed cavin-4 immunoreactivity in the cardiac muscle sheath of the pulmonary veins. Intense immunoreactivity for cavin-4 was observed in the membrane of bronchial and tracheal smooth muscle cells but was not prominent in the pulmonary artery smooth muscle. Intrapulmonary airway epithelium was also not labelled for cavin-4. In conclusion, distribution patterns point to involvement of cavin-1 in cav-1-dependent and of cavin-4 in cav-3-dependent caveolae formation. In tracheal ciliated epithelial cells, we previously noted cav-3 in an apical vesicular compartment, distinct from caveolae. This lack of caveolae formation in the presence of cav-3 in these cells might be caused by the absence of cavin-4 as revealed in the present study.

Kategorie: Poster

Poster 79:

Titel:The heterogeneity of the erythrocyte population of stored red blood cells probed using atomic force microscopy.

Autoren: Khayrullin R.(1),Lamzin I.(1),

Adressen:(1)The Department of Human Anatomy|Ulyanovsk State University|Ulyanovsk|Russia; email:prof.khayrullin@gmail.com

Abstract:
A big number of researches have been dedicated to the examining of the morphological and functional diversity of the erythrocyte population of the healthy human beings. Up till now qualitative differences between erythrocytes have been studied while checking their tolerance to haemolytic substances. An atomic-force microscopy is a modern method that gives an opportunity to visualize cells and investigate their biophysical characteristics. One of the biophysical criterion that enables to assess the quality of the cell is its stiffness. The degree of the stiffness changes can show the extent of the destructive processes of the cell ageing. The aim of this work was to investigate the age heterogeneity of the erythrocyte population of the stored red blood cells at the different stages of storing according to the criterion of the cell stiffness. 5 series of dry cytosmears of the red blood cells have been investigated: 1, 7, 14, 21 and 35 days of storing. After imaging 5 cells were chosen randomly in every specimen. Then the mean value of Young modulus was calculated for each cell. The number of the measures totaled 220 erythrocytes. In transition from 1,81±0,44 KPa (M±σ) (group 1) to 3,23±0,70 KPa (M±σ) (group 5) a wide gap between the maximum and the minimum values of the mean value of Young modulus can be steadily observed in all examined series of the cytosmears. All results have a very high statistical significance ($p<0,001$). Received data enable to estimate the retention of the “age” heterogeneity of the erythrocyte population in the course of preservation and storage.

Kategorie: Poster

Poster 80:

Titel:Imaging in anatomy: a comparison of imaging techniques of embalmed human cadavers

Autoren: Kielstein H.(1),Schramek R.(1),Stoevesandt D.(2),Reising A.(3),Kielstein J.(3),Hiss M.(3),

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Abstract:
A large variety of imaging techniques is an integral part of modern medicine. Introducing radiological imaging techniques into the dissection course serves as a basis for multidisciplinary learning in pre-clinical medical education. Instead of presenting radiological images of patients we provide computed tomography (CT) and magnetic resonance imaging (MRI) scans of our body donors. Viewing changes of ‘their’ body donor on medical images and exploring them by dissection afterwards results in students’ fascination and motivation. For this study four different imaging techniques (ultrasound, radiography, CT, and MRI) were performed in embalmed human body donors to analyze possibilities and limitations of the respective techniques in this peculiar setting. The quality of ultrasound and radiography images was poor. Evaluation of reliable organ measurements with ultrasound was unsuccessful due to severe gas artifacts. As a consequence to the sagging of abdominal organs and additional gas artifacts in the abdominal aorta, scarcely any structure was radiologically identifiable. However, images of CT and MRI were of very good quality. We conclude that CT and MRI are suitable methods for imaging embalmed human bodies. In our view, the high logistic effort for those two techniques is justified given the superior image quality in comparison to ultrasound and x-ray. Moreover, both CT and MRI even allow the three-dimensional reconstruction of anatomical structures or pathological processes. Despite the involved cost and effort we are convinced that the dissection of structures that underwent imaging prior to anatomical dissection represents a valuable addition to early medical education.

Kategorie: Poster

Poster 81:

Titel:Gender-specific topographic aspects on the course of the supraorbital vascular-nerve bundle with regard to migraine surgery

Autoren: Konschake M.(1),Berchtold V.(1),Brenner E.(1),Pikula R.(2),Pauzenberger R.(3),

Adressen:(1)Department of Anatomy, Histology and Embryology|Division of Clinical and Functional Anatomy|Innsbruck|Austria; email:marko.konschake@i-med.ac.at; (2)Department of Plastic and Aesthetic Surgery|Department of Plastic and Aesthetic Surgery, Innsbruck Medical University|Innsbruck|Austria; (3)Department of Surgery|Division of Plastic and Reconstructive Surgery|Vienna|Austria

Abstract:
Aim: Recent findings on the pathogenesis of migraine headache argue against a central vasogenic cause and verify a peripheral mechanism involving compressed craniofacial nerves. The study was designed to reveal gender relationships between the different supraorbital structures and give a rational for the increasing incidence of migraine headache in women. Methods: The supraorbital regions of 10 alcohol-glycerine fixed specimens of both sexes were dissected. Both the supratrochlear (STN) and the supraorbital nerve (SON) were identified and their topographical relationship with the corrugator supercilii muscle (CSM) investigated. The shape of their exit from the orbita nerves was defined, the interaction of the supraorbital artery (SOA) and the SON determined. Results: We found three compression points of the STN. The nerve exits from the orbita in 50% with two branches. In seven cases, it pierced as a whole or already ramified, the CSM. The SON entered the brow by the supraorbital notch, which was bridged by a ligament in seven cases; one hemiface showed a foramen. In males, just the medial branch pierced the CSM, whereas in females in eight out of ten cases the SON pierced the muscle completely with all branches. We also detected a larger expansion laterally of the CSM in females than in males. In seven cases the SOA crosses the SON; in one case the SOA runs with the SON. Conclusion: Our data support the hypothesis of a gender-specific peripheral mechanism for migraine headache. Surgical release of the perforating nerves by splitting the CSM can result in amelioration of migraine headache.

Kategorie: Poster

Poster 82:

Titel:„mors auxilium vitae“– causes of death of body donors in an Austrian anatomical department

Autoren: Konschake M.(1),Brenner E.(1),

Adressen:(1)Department of Anatomy, Histology and Embryology|Division of Clinical and Functional Anatomy|Innsbruck|Austria; email:marko.konschake@i-med.ac.at

Abstract:
Background: Anatomical dissection is, despite several critical annotations, a valuable component of medical education. Among the animadversions, the majority of body donors are accused to suffer from extreme body shapes or usually die from tumour diseases. Our current causes-of-death statistic of our body donors is aimed to disprove those prejudices. Methods: We evaluated the causes of death stated in their death certificates of altogether 3.399 people who donated their bodies to our department in the course of the last 25 years (1988 – 2013). The categorisation is based on the official ICD-10-WHO classification. Results: Our data show a prevalence of cardiovascular diseases (42%); no gender difference could reveal for both genders in cardiovascular diseases. Tumours were responsible for about 20 % of deaths. Cancers showed a slight male excess. All other deaths were caused by diseases of the respiratory system, the digestive organs, the genitourinary system, the nervous system, alimentation and metabolic disorders, infections and blood diseases, psychiatric disorders, external and other causes. Compared to the official Austrian and German statistics, there are only minor deviations. Conclusion: Or data clearly show that body donors depict a representative sample of Austrian population in terms of their causes of death, and do not show the aforementioned extremes. Therefore anatomical dissection provides an appropriate insight into the morbidity of the increasing major target population of medicine, the elders. Being aware of these facts, the anatomical dissection course can not only provide anatomical learning experiences but can also provide basics of epidemiology. Therefore a topographical dissection course, run by clinical anatomists, remains an indispensable component in education to ensure the patients’ wellbeing.

Kategorie: Poster

Poster 83:

Titel:New anatomic laparoscopic approach for neuromodulation of the pudendal nerve

Autoren: Konschake M.(1),Foditsch E.(2),Zimmermann R.(2),Hörmann R.(1),Janetschek G.(2),Künzel K.(1),

Adressen:(1)Department of Anatomy, Histology and Embryology|Division of Clinical and Functional Anatomy|Innsbruck|Austria; email:marko.konschake@i-med.ac.at; (2)Department of Urology|Spinal Cord Injury and Tissue Regeneration Centre Salzburg, Paracelsus Medical University|Salzburg|Austria

Abstract:
Aim: The aim of this study was to optimize a new minimal invasive laparoscopic electrode implantation directly to the pudendal nerve. This is attractive for neuromodulation therapy, offering a promising therapeutic approach to patients affected by bladder dysfunctions such as overactive bladder or urinary incontinence. Methods: In six embalmed human specimens, we dissected the anatomical layers of the pelvis. The courses of blood vessels, nerves and ligaments as well as their relation to bony structures were documented photographically. We adapted the laparoscopic access for locating the pudendal nerve straight in its course around the medial part of the sacrospinous ligament (SSL) in order to document and test for feasibility. The landmarks for intraoperative neuronavigation towards the pudendal nerve as well as the possible position for fixation of an electrode were selected and demonstrated. Results: The visible medial umbilical fold and the intrapelvine part of the internal pudendal artery (IPA) are the landmarks to locate the pudendal nerve. This nerve crosses dorsally the medial part of the SSL in vicinity to the ischial spine, medially to the IPA. The medial part of the SSL has to be exposed in order to display the nerve. An electrode can be placed ventrally on the nerve, fixed on the SSL. Conclusion: Due to our results, an intraoperative navigation system can be implemented to minimize invasiveness and to reduce operation time. The best shape of the electrode has yet to be determined and is subject of current discussion.

Kategorie: Poster

Poster 84:

Titel:Function of apol1 in the zebrafish pronephros studied by novel imaging methods

Autoren: Kotb A.(1),Rumpel E.(1),Simon O.(1),Vogelgesang S.(2),Endlich K.(1),Endlich N.(1),

Adressen:(1)Anatomie und Zellbiologie|Universitätsmedizin Greifswald|Greifswald|Germany; (2)Pathologie|Universitätsmedizin Greifswald|Greifswald|Germany

Abstract:
APOL1 which encodes a secreted high density lipoprotein is expressed in a number of human tissues, including the kidney. Recently it was shown that genetic variants of APOL1 are associated with kidney diseases in African Americans. In human kidney, APOL1 is expressed mainly in podocytes, in extraglomerular endothelial cells and some tubules. Since an ortholog of APOL1 does not exist in mice, the zebrafish is an ideal model to study the function of this protein. After knockdown (KD) of zApoL1 in zebrafish larvae by injection of specific morpholinos into fertilized eggs, the larvae developed severe pericardial edema accompanied by a lower number of glomerular capillaries. To determine whether zApoL1 KD affects glomerular filtration we injected fluorescence-labeled 10 and 500 kDa dextran into the cardinal vein of zebrafish larvae and studied the filtration process by measuring the fluorescence intensity in vessels over time. With this method we detected intact filtration, but compromised glomerular barrier function after zApoL1 KD. After injection of in vivo morpholinos into zebrafish larvae we observed a reorganization of the glomerulus directly in living zebrafish larvae by two-photon microscopy. Further, we found by immunofluorescence that the expression of the slit diaphragm protein nephrin was significantly reduced after zApoL1 KD. ApoL1 and nephrin expression were also correlated in biopsies of patients suffering from FSGS and membranous glomerulonephritis. In summary, our data demonstrate that zApoL1 is important for the proper expression of nephrin in podocytes and necessary for an intact glomerular filtration barrier in zebrafish larvae.

Kategorie: Poster

Poster 85:

Titel:The classification of primary afferent neurons in the trigeminal ganglion in humans

Autoren: Krastev D.(1),Krastev N.(2),Kalniev M.(2),Apostolov A.(3),Mileva M.(4),Stoyanov S.(5),

Adressen:(1)Anatomy and Histology|College of Medicine; Medical University-Sofia|Sofia|Bulgaria; email:dimo_krustev@mail.bg; (2)Anatomy and Histology|Medical University-Sofia|Sofia|Bulgaria; (3)Forensic Medicine and Deontology|Medical University-Sofia|Sofia|Bulgaria; (4)Institute of Microbiology|Bulgarian Academy of Sciences|Sofia|Bulgaria; (5)German Centre for Neurodegenerative Diseases|TZNE|Magdeburg|Germany

Abstract:
The purpose of this presentation is to make a comparative analysis of morphological characteristics by cytological techniques and attempt to classify the primary afferent neurons in the trigeminal ganglion in a human. To accomplish this goal, we set the following tasks: 1. Light-microscopic examination of the structure of TG in humans using the methods of Nissl. 2. Comparative analysis of morphological characteristics of primary trigeminal afferent neurons in human TG. 3. Based on established cytological characteristics of neuronal population of TG in person to attempt a morphological classification. As a material for the present morphological study is used TG 80 cadavers equally by both sexes for a period of nine years. Experiments were conducted in strict compliance with the ethical principles for handling cadaveric material applied in the Medical University of Sofia. Photographs were made courtesy of Centre for Neurodegenerative Diseases, Magdeburg, Germany by Dr. Stoyanov. According to cytological characteristics split TG neurons in 5 groups: 1. Large; 2. Medium; 3. Small; 4. Neurons with elongated body; 5. Neurons with polygonal shape. All except Large neurons are divided into two subtypes of light and dark.

Kategorie: Poster

Poster 86:

Titel:Comparative characteristics of nadph diaphorase accumulation in primary afferent neurons in the trigeminal ganglion and mesencephalic trigeminal nucleus of humans

Autoren: Krastev D.(1),Krastev N.(2),Kalniev M.(2),Apostolov A.(3),Mileva M.(4),Stoyanov S.(5),

Adressen:(1)Anatomy and Histology|College of Medicine; Medical University-Sofia|Sofia|Bulgaria; email:dimo_krustev@mail.bg; (2)Anatomy and Histology|Medical University-Sofia|Sofia|Bulgaria; (3)Forensic Medicine and Deontology|Medical University-Sofia|Sofia|Bulgaria; (4)Institute of Microbiology|Bulgarian Academy of Sciences|Sofia|Bulgaria; (5)German Centre for Neurodegenerative Diseases|TZNE|Magdeburg|Germany

Abstract:
Despite the difficulties in working with human cadaveric material present a comparative analysis in the accumulation of NADPH diaphorase in primary afferent neurons in the trigeminal ganglion and mesencephalic trigeminal nucleus. With light microscopic technique we present the visible difference between the two anatomical structures of similar origin. For this study we used human material 80 cadaveric equally by both sexes for a period of nine years. The study took place by a standard protocol approved by the city of Sofia Medical University in strict compliance with ethical and legal principles for handling choveshi material. Photographs were made courtesy of Centre for Neurodegenerative Diseases, Magdeburg, Germany by Dr. Stoyanov. Despite their similar origin and function the neurons building trigeminal ganglion and mesencephalic trigeminal nucleus in humans have significant differences. The study shows a distribution of the enzyme responsible for the synthesis of NO, nitric oxide synthase (NOS), and particularly the neuronal isoform (nNOS) in primary afferent neurons of the trigeminal ganglia (TG) and the mesencephalic trigeminal nucleus (MTN) to human. As it is known a nitrogen oxide (NO) is a highly reactive gaseous molecule which is involved in many physiological functions in central and peripheral nervous system. We found noticeable NADPHd presence in primary afferent neurons in the TG in humans. The intensity of staining in this histochemical reaction was highly variable, but it is most significantly manifested in the group of small and medium-sized neurons.

Kategorie: Poster

Poster 87:

Titel:Immunoreactivity and differences of neurons involved in building in the periaqueductal gray nucleus in humans

Autoren: Krastev N.(1),Krastev D.(2),Kalniev M.(1),Apostolov A.(3),Mileva M.(4),Bocheva A.(5),

Adressen:(1)Anatomy and Histology|Medical University-Sofia|Sofia|Bulgaria; email:niky_krustev@mail.bg; (2)Anatomy and Histology|College of Medicine; Medical University-Sofia|Sofia|Bulgaria; (3)Forensic Medicine and Deontology|Medical University-Sofia|Sofia|Bulgaria; (4)Institute of Microbiology|Bulgarian Academy of Sciences|Sofia|Bulgaria; (5)Pathophysiology|Medical University-Sofia|Sofia|Bulgaria

Abstract:
Central neurochemical pathways responsible for the activation of the stress system form a complex system in the CNS containing stimulating and inhibitory nets with multiple locations for inter connections that modulate the adaptive response. Important part of mesencephalon associated with activation of endogenous opioid peptides in response to stress is periaqueductal gray (PAG). It controls various reactions such as defensive behavior, autonomous changes vital adaptational processes in the human organism maintaining itâ€™s physiological balance in the neural and humoral responses by opioid peptides and antiopioid. It is known that in the state of stress there is influence over the opioid receptors in the PAG, as well as the expression of nitric oxide synthase (NOS). They activate downstream opioid and noradrenergic pathways and inhibit nociception at the level of the spinal cord. The morphological analysis of histological sections was conducted at the level where PAG was visualized. In one of the PAG is observed a heterogeneous group of immunoreactive neurons with relatively small dimensions are grouped into three classes with different configuration of the bodies of the neurons. We introduce the neurons involved in the construction of this nucleus.

Kategorie: Poster

Poster 88:

Titel:Cytological differences in sensory neurons and ganglion trigeminale and nucleus tractus mesencephali nervi trigemini per person

Autoren: Krastev N.(1),Krastev D.(2),Kalniev M.(1),Apostolov A.(3),Mileva M.(4),Stoyanov S.(5),

Adressen:(1)Anatomy and Histology|Medical University-Sofia|Sofia|Bulgaria; email:niky_krustev@mail.bg; (2)Anatomy and Histology|College of Medicine; Medical University-Sofia|Sofia|Bulgaria; (3)Forensic Medicine and Deontology|Medical University-Sofia|Sofia|Bulgaria; (4)Institute of Microbiology|Bulgarian Academy of Sciences|Sofia|Bulgaria; (5)German Centre for Neurodegenerative Diseases|TZNE|Magdeburg|Germany

Abstract:
Despite their similar origin and function neurons building trigeminal ganglion and mesencephali trigeminal nucleus in humans have a significant differences. With light-microscopic technique we present the differences between the two anatomical structures. For this study we used human material 80 corpses equally by both sexes for a period of nine years. The study proceeded in a standard protocol approved by the Medical University,Sofia in strict compliance with ethical and legal principles for handling human material. Photographs were made courtesy of Centre for Neurodegenerative Diseases, Magdeburg, Germany by Dr. Stoyanov. Trigeminal sensory system is represented by pseudounipolar neurons located in the central menescephalici and circumferentially in the trigeminal ganglion. Neurons located in the brainstem of human form one unique in its structure and form the mesencephali trigeminal nucleus. Trigeminal ganglion is located outside the brain and itâ€™s represented by the neurons of pseudounipolar heterogeneous morphologic characteristics. We present the cytological differences of neurons making the two morphologically similar structures. They affect some morphological traits such as size and shape of neurons, intensity of staining due to different amounts of sputum organelles and accumulation of pigments in the cytoplasm associated with the ageing differences. We established a significant differences in glia (satellite cells) disposed around bodies of neurons

Kategorie: Poster

Poster 89:

Titel:Ischemia-related blood-brain barrier breakdown occurs in distinct stages of vascular damage in different models of experimental cerebral ischemia

Autoren: Krueger M.(1),Immig K.(1),Bechmann I.(1),Reichenbach A.(2),Härtig W.(2),Michalski D.(3),

Adressen:(1)Institute for Anatomy|University Leipzig|Leipzig|Germany; email:martin.krueger@medizin.uni-leipzig.de; (2)Paul Flechsig Institute for Brain Research|University Leipzig|Leipzig|Germany; (3)Department of Neurology|University Leipzig|Leipzig|Germany

Abstract:
Ischemic stroke represents one of the leading causes of death worldwide and surviving patients often suffer from long lasting disabilities. Of note, the underlying ischemia not only impairs proper neuronal function but also detrimentally affects the vascular function as indicated by loss of blood-brain barrier (BBB) integrity. In the clinical setting, these alterations can be reflected by the risk for hemorrhagic transformation and intracerebral bleeding following therapeutical recanalization via tPA, which is traditionally attributed to a ‘reperfusion injury’ including BBB breakdown. Therefore, we applied multiple immunofluorescence labeling and electron microscopy in a rat model of thromboembolic middle cerebral artery occlusion (eMCAO) and mouse models of permanent (pMCAO) and transient (tMCAO) ischemia to investigate the mechanisms underlying ischemia- and reperfusion-related BBB breakdown. Areas exhibiting BBB breakdown were identified by the permeability marker FITC-albumin. Strikingly, analysis of expression patterns for tight junction (TJ) markers in the applied models consistently revealed detectable TJ proteins in areas of FITC-albumin leakage. However, lectin stainings of the endothelial marker IB4 indicated structural alterations of the endothelium, which were confirmed by electron microscopy. As the observed ultrastructural pattern of endothelial damage was equally present in the applied stroke models including the reperfusion scenario, we identified four distinct stages of BBB breakdown, which ultimately lead to loss of endothelial cells. Thus, our data suggest that ischemia-related BBB breakdown is primarily caused by endothelial degeneration. Therefore, protection of endothelial cells in combination with established recanalizing strategies may turn out as a promising concept for future treatment strategies.

Kategorie: Poster

Poster 90:

Titel:Comparative analysis of epithelial-to-mesenchymal transition in matched primary and recurrent glioblastomas

Autoren: Kubelt C.(1),Sebens S.(2),Mehdorn H.(1),Held-Feindt J.(1),Hattermann K.(3),

Adressen:(1)Klinik für Neurochirurgie|Universitätsklinikum Schleswig-Holstein, Campus Kiel|Kiel|Germany; (2)Institut für Experimentelle Medizin|Universitätsklinikum Schleswig-Holstein, Campus Kiel|Kiel|Germany; (3)Anatomisches Institut|Christian-Albrechts-Universität zu Kiel|Kiel|Germany; email:k.hattermann@anat.uni-kiel.de

Abstract:
Objective: Highly malignant glioblastomas have a median survival time of less than one year which is associated with fast and aggressive relapses. They achieve their progressive character via epithelial-to-mesenchymal transition (EMT); however, comparative surveys on EMT in primary glioblastomas versus relapses are presently not available. Thus, our current study examines the expression profile of different EMT-markers in matched primary and recurrent glioblastomas. Methods and results: In comparison to primary tumours, beta-Catenin ($p<0.05$), Snail1 ($p<0.05$), Snail2 ($p<0.05$), Biglycan ($p<0.05$) and Twist1 ($p<0.01$) were downregulated in relapses whereas L1CAM showed an upregulation ($p<0.05$; qPCR). Desmoplakin, Vimentin, Fibronectin, TGF beta1 and Akirin2 seemed to be not regulated (qPCR). To clearly distinguish whether these alterations are related to the tumour cells, the tissues were analysed using immunofluorescence double-staining. Expressions of different EMT markers in combination with cell specific markers (glial fibrillary acidic protein, CD11b, von Willebrand factor) were found in patient and tumour specific patterns. Additionally, temozolomide was able to induce mRNA expression of Twist1, beta-Catenin, Desmoplakin, Vimentin and L1CAM to significant extents in different glioblastoma cells lines (A172, T98G; $p<0.05$; qPCR), whereas TGF beta1 stimulation yielded only a significant upregulation of Vimentin and Desmoplakin in T98G cells ($p< 0.001$; $p< 0.05$). Conclusion: The expression profile of EMT-markers showed inter-individual differences between the examined patients as well as the cell lines. Despite the variability certain alterations in the expression profile of EMT-markers in primary tumour and relapse can be noticed which may play a role in the increased motility and invasiveness of the relapsing disease.

Kategorie: Poster

Poster 91:

Titel:The transcription factor nrf2 and the fetal vascular function; potential implication in the pathogenesis of preeclampsia

Autoren: Kweider N.(1),Lambertz J.(1),Rath W.(2),Pufe T.(1),Wruck C.(1),

Adressen:(1)Department of Anatomy and Cell Biology|RWTH Aachen University|Aachen|Germany; email:nkweider@ukaachen.de; (2)Obstetrics and Gynecology|University Hospital of the RWTH|Aachen|Germany

Abstract:
OBJECTIVES Increased oxidative stress during pregnancy is associated with preeclampsia. The transcription of many antioxidative-genes is mediated mainly through the transcription factor Nrf2. A link between Nrf2 and the vascular homeostasis in preeclampsia has been discussed. To assess the interaction between Nrf2-signaling and the angiogenic-processes, we examined in vitro the effect of Nrf2-activation on the expression of some basic pro-and anti-angiogenic factors. Then the placental phenotype of the Nrf2-knockout mice (Nrf2-/-) and -wild type (Nrf2+/+) around embryonic day 18.5 was investigated. METHODS Trophoblast-like cells (BeWo and JEG-3) and the primary human umbilical vein endothelial cells (HUVECs) have been used. ELISA, scratch- and tube formation-assays were mainly applied in this study. The expressions of VEGF and heme oxygenase (HO-1) in the mouse placenta were examined by immunohistochemistry. RESULTS The induction of HO-1-expression via Nrf2 led in all cell types to a significant increase in the protein levels of VEGF and decrease in the augmented-sFlt-1. It also enhanced tube formation and migration of the endothelial cells. Nrf2-/- embryos were 13% smaller than Nrf2+/+ ones. The Phenotypic analysis of the mouse-placenta showed presence of trophoblast clusters in the labyrinth of Nrf2-/--placentas. The labyrinth zones of these placentas were smaller when compared to Nrf2+/+-ones. CONCLUSION The activation of Nrf2 in vitro inhibited the release of sFlt-1 and exerted pro-angiogenic effects in the endothelial cells. Our results also demonstrated that disruption of Nrf2-signalling results in reduction in the efficiency of the placenta, increases placental oxidative stress which negatively affects the fetal development.

Kategorie: Poster

Poster 92:

Titel:Activation of the transcription factor nrf2 modulates the syncytialization of the human placental trophoblast

Autoren: Lambertz J.(1),Rath W.(2),Pufe T.(1),Wruck C.(1),Kweider N.(1),

Adressen:(1)Department of Anatomy and Cell Biology|RWTH Aachen University|Aachen|Germany; (2)Obstetrics and Gynaecology|University Hospital RWTH Aachen|Aachen|Germany

Abstract:
Objectives: Increased oxidative stress and diminished oxidative capacity are distinctive features in the pregnancy-specific syndrome preeclampsia. Activation of the nuclear factor erythroid 2-related factor 2 (Nrf2) initiates and enhances the transcription of many antioxidative enzymes, protecting the cells against oxidative injury. Multinucleated syncytiotrophoblast (STB) layer acts as the first line of defence against placental oxidative stress. Cytotrophoblasts (CTB) differentiate and fuse with the STB to maintain the multi-nucleated layer. Our group has shown that Nrf2 is exclusively active within the CTB of preeclamptic placentas, a disturbed Trophoblast fusion has also been reported in preeclampsia. A link between Nrf2-signal transduction pathways and trophoblast fusion has not yet been investigated. Methods: We used the choriocarcinoma cell lines JEG 3 and BeWo to test the involvement of Nrf2 in the fusion process of the CTB. Using CellTrackerTM MoBiTec, the cells were stained in green and red, seeded together and stimulated with Nrf2-activator; Andographolide. Fusion process was observed via live cell imaging over 48 hours. Fused cells were recognized as orange-stained cells. Results: Activation of Nrf2 via Andrographolide enhanced the cell fusion when compared to the untreated cells. Furthermore, following the co-treatment with Andrographolide and Forskolin the cells showed an increase in the percentage of nuclei contained in syncytia compared to each substance alone. Conclusion: Our results suggest that the activation of Nrf2 via Andrographolide regulates the fusion of CTB-like cells. Nrf2 plays also a crucial role in the protection of cells against oxidative damage. Thus Nrf2 may interfere with normal trophoblastic functions.

Kategorie: Poster

Poster 93:

Titel:Inflammasome activation after transient focal cerebral ischemia in rats

Autoren: Lammerding L.(1),Slowik A.(1),Beyer C.(1),Zendedel A.(1),

Adressen:(1)Institute of Neuroanatomy|RWTH Aachen University|Aachen|Germany; email:cbeyer@ukaachen.de

Abstract:
Reperfusion is an effective way to contain ischemic brain damage. However, reperfusion itself may cause tissue injury by boosting inflammatory responses. Previously, we have shown that 17beta-estradiol (E2) and progesterone (P) are neuroprotective and reduce the infarct volume by 60% and prevent behavioural deficits in a long-term survival study after stroke. Recent findings suggest novel inflammatory mechanisms that contribute to ischemic tissue injury which are mediated by multi-protein complexes termed inflammasomes. Inflammasomes activate the pro-inflammatory cytokines interleukin 1beta (IL 1beta) and IL 18 which are implicated in ischemic brain injury and cell death. Using a rat transient middle cerebral artery occlusion (2h tMCAO) model, this study examined the cellular distribution and dynamic chronological expression of several inflammasomes during cerebral ischemia and reperfusion at 6, 12, 24 and 72 h in the penumbra. In addition, we aimed at analyzing whether neuroprotective action of E2 and P is predicated on the attenuation of inflammasome activation. Expression of the inflammasomes NLRP3, AIM2 and NLRC4 as well as interleukin (IL)-1beta and IL-18 increased temporally graded during the first 24h which coincides with the expression profile of other inflammatory markers such as IL-1beta, IL-18, iNOS and TNFalpha. Both steroid hormones significantly reduced the levels of NLRP3, NLRC4, AIM2 and the IL-1beta. Our data provide clear evidence that hypoxia stimulates a complex scenario of inflammasome activation in the penumbra and that sex steroid-mediated neuroprotection presumably depends on the inflammasome regulation.

Kategorie: Poster

Poster 94:

Titel:Neuroanatomical correlates of pain-deficiency and pain-induced synaesthesia

Autoren:Landmann J.(1),Oros-Peusquens A.(2),Classen J.(3),Penninger J.(4),Shah N.(2),Bechmann I.(1),

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Abstract:
Functional MRI studies with pain-deficient mice (Ca2+channel subunit alpha2delta3 KO) revealed sensory cross-activation in different cortical areas traditionally considered unimodal (V1, A1), while pain-related areas (S1, M1) were inhibited (Neely + Hess et al., Cell 2010). As synaesthesia is still a barely understood phenomenon, a2d3KO mice may provide a model to gain mechanistic insights. Analyses of different Ca2+channels revealed expressional modifications, which suggest an altered excitability of cortical neurons in a2d3KO animals. Moreover, histological and MRT analyses showed that the deficit of a2d3 can cause some severe anatomical alterations in white and grey matter structures. The gross connectivity between thalamus and cortex appeared similar between WT and a2d3KO mice. However, the differentiation in afferents and efferents show a massive disparity in projection and commissural fibers. L1-stainings exhibit a reduction of thalamocortical fibers reaching somatosensory/motor cortical areas, which could result in a less efficient transmission of the pain signal to cortical areas in the mutant mice. Moreover, observed aberrant fibers running to visual cortical areas may contribute to the sensory cross-activation found in the mutant. We could further demonstrate alterations in the connectivity at cortical level, which suggests changes in the intra- and intercortical connectivity contribute to synaesthetic experiences. These findings go along with the concept of hyperconnectivity for the development of synaesthesia. Our data demonstrate various differences in neuroanatomical connectivity of a2d3KO mice which from a hodological point of view are in line with their observed synaesthetic phenotype.

Kategorie: Poster

Poster 95:

Titel:Decreased expression of snare-complex proteins in diverticular disease

Autoren: Lange C.(1),Böttner M.(1),Barrenschee M.(1),Egberts J.(2),Becker T.(2),Wedel T.(1),

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Abstract:
Background and aims: Intestinal motility is controlled by the enteric nervous system that communicates with the intestinal smooth muscle cells via neurotransmitters. An intact neurotransmitter release machinery requires proteins of the SNARE (soluble N-ethylmaleimide-sensitive-factor attachment receptor) complex essential for the fusion of synaptic vesicles with the pre-synaptic membrane. Patients with diverticular disease (DD) are characterized by an enteric neuropathy and frequently show an impaired intestinal motility. Therefore, we analyzed the SNARE complex proteins SNAP-25, synaptobrevin, and synaptophysin in the distal colon of patients with DD and controls to clarify whether the synaptic vesicle apparatus is disturbed. Material and methods: In colon samples obtained from patients with DD and controls quantitative real-time-PCR analysis was performed for SNAP-25, synaptobrevin, and synaptophysin on mRNA samples extracted from tunica muscularis and myenteric ganglia harvested by laser microdissection (LMD). The expression of the corresponding proteins was assessed by immunohistochemistry on colon tissue of patients and controls. Results: Transcription of SNAP-25 and synaptophysin was impaired in the tunica muscularis of patients with DD compared to controls. In myenteric ganglia of patients with DD transcription of all three genes was reduced. Immunoreactivity of all studied proteins was decreased within myenteric ganglia of colon tissue sections in patients with DD compared to controls. Conclusion: Our data provide evidence for an impaired neurotransmitter release machinery both at gene and protein expression level in patients with DD. These findings further add evidence for an enteric neuropathy underlying DD and might contribute to the disturbed intestinal motility frequently observed in DD.

Kategorie: Poster

Poster 96:

Titel:Aberrant presentation of hpa-reactive carbohydrates implies selectin-independent metastasis formation in human prostate cancer

Autoren: Lange T.(1),Kupfernagel M.(1),Wicklein D.(1),Gebauer F.(1),Maar H.(1),Simon R.(2),Schlomm T.(3),Sauter G.(2),Schumacher U.(1),

Adressen:(1)Institute of Anatomy and Experimental Morphology|University Medical Center Hamburg-Eppendorf|Hamburg|Germany; email:to.lange@uke.de; (2)Insitute of Pathology|University Medical Center Hamburg-Eppendorf|Hamburg|Germany; (3)Martini-Clinic, Prostate Cancer Center|University Medical Center Hamburg-Eppendorf|Hamburg|Germany

Abstract:
Metastasis formation is the major clinical problem in prostate cancer and still remains poorly understood. In general, after detachment of cancer cells from the primary tumor and invasion into the blood circulation, their adhesion to vascular endothelium at a distant site is critical for metastasis as it precedes transendothelial migration and hence infiltration of the organ. Similar to leukocytes that are leaving a vessel during inflammation, adhesion of several human tumor cells is initiated by interactions of selectin ligands at their surface with E- and P-selectin at the endothelium. This interaction initiates a cascade that opens the endothelial barrier so that cancer cells can enter the organ. Hence, endothelial selectins were shown to be crucial determinants of metastasis in different cancers. This is the first study demonstrating that human prostate cancer (PCa) cells can leave the blood stream at a distant site independently of endothelial selectins. This unexpected finding was revealed by applying spontaneous metastasis xenograft models, where we could detect metastatic PCa cells in the lung stroma of E-/P-selectin-deficient mice. Moreover, PCa cells show a low potential to synthesize common intermediates of selectin ligands and do not adhere to selectins or pulmonary endothelium in vitro. In our clinical studies, E-selectin binding sites were detectable in prostatectomy specimens of only 32 of 1,600 patients. Selectin ligand intermediate presentation in these tissues even predicted beneficial clinical courses and decreased in corresponding lymph node metastases. This work indicates selectin-independent mechanisms of transendothelial migration, which have never been suspected in PCa so far.

Kategorie: Poster

Poster 97:

Titel:The nrf2/are-system as a master regulator of cellular stress responses in selective oligodendrocyte loss

Autoren:Liessem A.(1),Draheim T.(1),Weißflog M.(1),Fragoulis A.(2),Pufe T.(2),Beyer C.(1),Kipp M.(1),Wruck C.(2),Clarner T.(1),

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Abstract:
In neurodegenerative diseases oligodendrocyte loss is a characteristic histopathological feature. Due to high metabolic activity, oligodendrocytes might be especially vulnerable to disturbances of mitochondrial activity and subsequent oxidative damage. Nrf2 is a master regulator of cellular responses to oxidative damage. After the release from its inhibitor Keap1, Nrf2 binds to the antioxidative-response-element (ARE) in the promotor region of its target genes. In this study, we aimed to elucidate the importance of the Nrf2/ARE-system for oligodendrocyte pathophysiology. Selective oligodendrocyte loss was induced by feeding mice the copper chelator cuprizone. Using in vivo imaging of luciferase activity in a transgenic mouse expressing luciferase under the control of ARE, we found the Nrf2/ARE-system to be activated in response to cuprizone. Furthermore, the expression of Nrf2 target genes was found to be induced. Gene-array analyses revealed that the Nrf2 activity correlates with the induction of Lon-peptidase, an enzyme critically involved in the maintenance of mitochondrial functions via the degradation of oxidative damaged proteins. Promoter studies using an oligodendrocyte cell line suggest Lon-peptidase as a novel target gene for Nrf2. Additional shRNA-silencing experiments for Nrf2 and Keap1 demonstrated the importance of the oligodendrocytic Nrf2/ARE-system for (i) the expression of Lon-peptidase and (ii) the vulnerability of oligodendrocytes under mitochondrial stress conditions. Finally, experiments using Keap1/GFAP-astrocyte-specific deficient mice confirmed the functional involvement of the Nrf2/ARE-system in selective oligodendrocyte loss. Future experiments will further characterize the regulation mechanisms and the functional role of oligodendrocytic Lon-peptidase for the development and progression of neurodegenerative diseases.

Kategorie: Poster

Poster 98:

Titel:Dermal arteries of the index finger

Autoren: Mathae M.(1),Reissig L.(1),Hechinger S.(1),Geyer S.(1),Weninger W.(1),

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Abstract:
Contradicting descriptions in textbooks and scientific articles, it was recently demonstrated that the dermal arteries of the human thumb pad do not feed a superficial dermal plexus. Instead they supply blood to circumscribed segments of the papillary dermis, thereby forming discrete dermal vascular units. This study aimed at researching whether the blood supply to the skin of the distal segment of the index finger is likewise organised in vascular units. Biopsies were harvested from the skin of the distal parts of the finger pad and dorsum of both index fingers of a female body donator (80 years). Employing the High Resolution Episcopic Microscopy (HREM) method digital volume data (voxel size: 0.85x0.85x1.5 micron3 were generated from each biopsy. The Amira software was then used for creating and analysing three-dimensional (3D) computer models of the dermal arteries. In both, the biopsies harvested from the dorsum and the pad of the index finger, the dermal arteries were ramifying in a tree-like manner. The branches of the trees were connected by an average of 2.5 anastomoses at the dorsum and 0.5 at the pad. In no specimen a superficial arterial plexus was found. Hence we have strong evidence that the skin of the index finger is, like the skin of the thumb pad, organized in vascular units. However studying additional individuals is required for the ultimate proof of the existence of dermal vascular units in the distal segment of the index finger.

Kategorie: Poster

Poster 99:

Titel:Uncemented glenoid metalback fixation: position of the superior implant screw in relationship to suprascapular nerve and scapular notch analysed in an anatomical cadaver dissection study.

Autoren: Mathews S.(1),Burkhard M.(1),Link K.(1),Franke I.(1),Harper G.(2),Qureshi F.(3),Bloch H.(4),Ullrich O.(1),Rühli F.(1),Eppler E.(1),

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Abstract:
Anatomic Total and Reverse Total Shoulder Arthroplasty is a common treatment option for primary and secondary osteoarthritis of the shoulder joint. Nevertheless, the superior glenoid baseplate screw might endanger the suprascapular nerve on its way through the scapular notch which could cause chronic postoperative pain. Despite this well-known complication, only a few studies have been performed so far to investigate the distance between the screw entry into the optimal direction of the screw until the scapular notch is reached. In a cadaver dissection study, we investigated 17 cadavers from the institutional body donation programme (8 female, 9 male, average age 78 yrs, range 63-99 yrs) for glenoid size and inclination angle. Furthermore, we measured the distance from the superior screw to the scapular notch both from outside and through the screw canal and, additionally, the distance from the supraglenoid tubercle to the scapular notch. The majority of dissected joints presented a degenerative illness, so in addition, pathologies such as primary and secondary osteoarthritis (cuff arthropathy) were documented. Further, we explored the relationship of the suprascapular nerve to the adjacent soft tissue including the suprascapular vessels. In order to achieve a solid data basis for future recommendations for safe screw placement and secure distance to the nerve, we are currently conducting a follow-up study. This will increase our sample size and provide additional data, e.g. on sexual dimorphism in the scapula size as related to the body length.

Kategorie: Poster

Poster 100:

Titel:Abnormal topology of the right phrenic nerve in an individual with cardiovascular malformations

Autoren: Maurer B.(1),Wlodek V.(2),Weninger W.(2),

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Abstract:
The presentation aims at presenting a detailed description of the thoracic organs and structures in an individual with abnormal topology of the right phrenic nerve. A female body donator, aged 59 years was anatomically dissected. After opening the thoracic cavity and exposing the internal thoracic vessels the phrenic nerve was noted to enter the thoracic cavity medially and below the vessels. Running in this relationship it descended until the level of the 3rd rib. Here it formed a corkscrew like sling around the internal thoracic vessels and then dived into the mediastinum to reach the diaphragm at its usual attachment site. Curious by this abnormal topology, we decided to examine the right subclavian artery and recognized that it arose as a fourth branch from the aortic arch and crossed to the right arm by transversing the esophagus dorsally. Since retro-esophageal right subclavian arteries often go hand in hand with other topological abnormalities and cardiac defects resulting from abnormal neural crest cell activity, we carefully dissected the thoracic organs and structures. In the poster we provide detailed descriptions of the morphology and topology of the thoracic organs and structures and briefly discuss the potential genesis of the abnormal topology of the phrenic nerve and its relevance for surgical interventions.

Kategorie: Poster

Poster 101:

Titel: ‘Painful’ anatomical ‘pain models’ in modern textbooks

Autoren: May C.(1),

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Abstract:
It dates back to a drawing used by Descartes that pain was directly associated with peripheral nerve sensations. At that time it was a hypothesis without precise structural knowledge and anatomists thereafter tried hard to demonstrate these â€˜pain nervesâ€™. They finally succeeded with some otherwise not assigned nerve bundles, running from the periphery to the spinal cord and continuing in the ventro-lateral part of the spinothalamic tract. Physiology and psychology nowadays demonstrated sufficiently that pain is a result of cognitive behavior associated with structures in the brain. Pain therefore changed from a sensory-like model to an emotion-like model. What remains is the associated anatomical structure. Most modern anatomical textbooks stick to the traditional description ignoring this obvious error. Some authors treat the problem by adding a new terminology, but the term â€˜nociceptionâ€™ still supports the â€˜oldâ€™ hypothesis. If we accept that pain is not a sensation but an interpretation of various sensations, we should no longer use the term â€˜pain fibersâ€™ but instead search for a physiological function of the wrongly assigned nerve fibers. Maybe, they are chemosensors. The consequence of this new view is not purely academic but also affects the pain model in pathologic conditions and the proper treatment of pain.

Kategorie: Poster

Poster 102:

Titel:Bisphosphonates – curse of oral implantology

Autoren: Meier F.(1),Birkemeyer C.(2),Berger F.(3),Punkt K.(1),Löffler S.(4),

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Abstract:
Purpose: Bisphosphonates are generally used in patients with osteoporosis or cancer in human medicine. Their application can cause severe complications in dentistry, e.g. osteonecrosis in the jaw bone resulting in the failure of osseointegration of implants. To address this problem more detailed, a detection method for bisphosphonates should be developed. Methods: Two bisphosphonates (Alendronic and Risedronic acid) were analyzed chemically without and with bone by mass spectrometry (HPLC and GCMS). The bony material derived from body donors of the institute of Anatomy and a long-treated patient from Saxonia-Klinik in Leipzig. Additionally, standard histology was performed after decalcification of the mandibles. In hematoxylin-eosin and van Gieson stained sections, the gingival-periostal connection was analysed by light microscopy. Results: Pure bisphosphonates could be detected chemically in the mass spectrometry, but unfortunately no longer in connection with the bony material. Histologically, the connection between periost and gingiva has not been displayed in detail, because the decalcification process for approximately 6 month lead to gap formation between the hard and soft tissues. Conclusion: Using exclusively morphological and standard chemical methods, the detection of bisphosphonates failed. The next step will be the analysis for the reasons and the development of an appropriate method. A generally impact of our study is to address the problem to the physicians (first of all the orthopaedics) with the option to vary the treatment protocol or to replace the applied therapy at least in a group of patients, where it is possible. A side effect is to give recommandations for procedures in implantology even in patients after treatment with bisphophonates depended on application and dose.

Kategorie: Poster

Poster 103:

Titel:Superficial branch of the radial nerve - anatomical correlation to us guided perineural infiltration

Autoren: Meng S.(1),Reissig L.(2),Tinhofer I.(2),Grisold W.(3),Weninger W.(2),

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Abstract:
This study's aim is at evaluating the effect of ultrasound guided perineural infiltration of the superficial branch of the radial nerve (SBRN) to foster the use of this procedure as a therapeutic option in Wartenberg's syndrome. 21 arms, stemming from 11 non-embalmed cadavers were examined with ultrasound (US). Then india ink was applicated perineurally to the SBRN proximal to the site, where it perforates the forearm fascia. Injection was followed by dissection to evaluate the distribution of the ink. US allowed clear visualization of all the segments of the SBRN' and their topology. Dissection following the injection of ink showed that the subfascial segment of the SBRN was stained in all specimens. In 57 percent the subfascially applied ink also penetrated the fascia and extended into the subcutaneous compartment. We conclude that US fits for examining all segments of the SBRN and for guiding application of a fluid perineurally to the SBRN. Thus US-guided treatment of Wartenberg’s syndrome is definitively feasible. Whether patients will profit from such a treatment needs to be evaluated in clinical follow up trails.

Kategorie: Poster

Poster 104:

Titel:Cell-cell crosstalk mediates transmission of cd24 surface expression from human neuroblastoma cells to non-transformed cells

Autoren: Menon V.(1),Ghale A.(1),Liu J.(1),Thomas R.(1),Pruszak J.(1),

Adressen:(1)Emmy Noether-Group for Stem Cell Biology, Department of Molecular Embryology|Institute of Anatomy and Cell Biology, University of Freiburg|Freiburg|Germany; email:jan.pruszak@anat.uni-freiburg.de

Abstract:
Microenvironmental cues play a critical role for stem cell development in tissue regeneration as well as in cancer progression. Reciprocal interactions of tumor cells with associated stromal tissues have recently been shown to occur in a variety of cancers. Neuroblastoma is the most frequent extracranial solid tumor in childhood with complex and still poorly understood pathophysiology. Adapting so-called flow cytometric barcoding techniques, we developed a paradigm that would enable us to detect differential surface molecule expression resulting from the controlled interaction of two cell populations in vitro. To this end we co-incubated the human neuroblastoma SH-SY5Y cell line with human foreskin-derived fibroblasts. We observed rapid and robust upregulation of CD24 (heat stable-antigen; small-cell lung carcinoma antigen) on the surface of BJ fibroblasts after co-incubation with SH-SY5Y cells. An even more profound effect of neuroblastoma-mediated CD24 induction was observed in a human induced pluripotent stem cell-derived neural cell line. This effect appeared to be associated with neuroblastoma cells, specifically, and was seen in an identical manner with a second CD24-positive neuroblastoma line. In summary, we observed a robust and rapid induction of CD24 surface expression via co-incubation with neuroblastoma cells in a range of human cells including neural stem, neural crest, and fibroblast cell lines, raising the possibility that altered surface molecule-mediated signatures on non-transformed cell types may contribute to the interaction of tumor cells with their immediate environment.

Kategorie: Poster

Poster 105:

Titel:Cluster of differentiation (cd) surface molecule signatures of the human neural lineage

Autoren: Menon V.(1),Horl M.(1),Pruszak J.(1),

Adressen:(1)Emmy Noether-Group for Stem Cell Biology, Department of Molecular Embryology|Institute of Anatomy and Cell Biology, University of Freiburg|Freiburg|Germany; email:jan.pruszak@anat.uni-freiburg.de

Abstract:
Cells interact with one another and their immediate environment via the repertoire of molecules expressed on their surface. Conversely, characteristic combinations of surface molecules can serve to identify and isolate specific subsets of cell types. Towards a comprehensive analysis of cluster of differentiation (CD) antigens expressed in human neural lineage differentiation, we exploited low- and high-throughput flow cytometric screens, fluorescence-activated cell sorting (FACS) and immunofluorescence techniques. Multivariate analysis paired with established data visualization algorithms yielded novel CD marker panels for neural proliferation versus differentiation across different cellular systems including human embryonic stem cell lines, long-term expandable neural lines derived from human induced pluripotent stem cells and neural cancer lines. These data provide candidates for further study of cell-cell communication in neural stem cell development as well as novel surface antigen codes for enriching neural stem cells, neural crest and post-mitotic neuronal subpopulations for biomedical applications including neural transplantation and in vitro models of human disease.

Kategorie: Poster

Poster 106:

Titel:Innervation of ligamentum suspensorium duodeni as reason for the abdominal pain - histological examination

Autoren: Mileva M.(1),Krastev D.(2),Krastev N.(3),Apostolov A.(4),Yaramov N.(5),

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Abstract:
Ligamentum suspensorium duodeni is essential morphological and clinical object which unfortunately is poorly observed in the scientific literature. From an anatomical point of view, it is presented as part of strengthening and fixing apparatus of the duodenum and is involved in maintaining of the pancreas, as well it is responsible for movement of the intestinal contents. The aim of this work was to examine the innervation of Ligamentum suspensorium duodeni as reason for the abdominal pain via light-microscopic and histological methods. For this purpose the human material of 48 patients equally by both sexes was used. The material was taken by surgery on the occasion of gastric carcinomas by the Clinic of General Surgery of the Sofiaâ€™s University. Ð• ll procedures were in accordant with the ethical and legal principles for anonymity and respect for human rights established by the city of Sofia to work with human material. Consent was taken from all patients. The taken materials were used for histological slides. The preparations were stained by the methods of Nissl. Photographs were made with the courtesy of Centre for Neurodegenerative Diseases, Magdeburg, Germany. Our findings showed the end of Ligament projects between truncus coeliacus and loosely displayed part of the trunk of a. et v. mesenterica sup. Due to its topographical relationships with the rear abdominal wall, tr. coeliacus, duodenum and pancreas, it take a place in morphological structure and probably cause clinical aspects of pain in the abdomen. With light microscopic technique we present innervation of this anatomical structure.

Kategorie: Poster

Poster 107:

Titel:Ligamentum suspensorium duodeni and nadph diaphoresis activity in humans

Autoren: Mileva M.(1),Krastev D.(2),Krastev N.(3),Kalniev M.(3),Apostolov A.(4),Stoyanov S.(5),

Adressen:(1)Department of Virology|The Stephan Angeloff Institute of Microbiology, Bulgarian Academy of Sciences|Sofia|Bulgaria; email:milkamileva@gmail.com; (2)Department of Anatomy and Histology|College of Medicine "Yordanka Filaretova"|Medical University|Sofia|Bulgaria; (3)Department of Anatomy and Histology|Medical University|Sofia|Bulgaria; (4)Department of Forensic Medicine and Deontology|Medical University|Sofia|Bulgaria; (5)Pathophysiology of dementia|TZNE Centre for Neurodegenerative Diseases|Magdeburg|Germany

Abstract:
Nitric oxide (NO) is a highly reactive gas molecule participating in many physiological and pathological functions of the central and peripheral nerves systems. This study is designed to present the distribution of the enzyme responsible for the synthesis of NO, nitric oxide syntheses (NOS), and particularly the neuronal isoform (nNOS) in the nerve fibers and receptors located in Ligamentum suspensorium duodeni in humans. To demonstrate neural structures used immunohistochemical method for nNOS specific marker for nicotinamide adenine dinucleotide phosphate diaphorase (NADPHd). The intensity of the histochemical reaction was highly variable in different regions of Ligamentum suspensorium duodeni according to the nerve clusters. It is assumed that NO may be involved in the modulation of abdominal pain as well as in the transmission and modulation of the impulses from the proprioceptive muscle spindles of the abdomen during pathological processes of the duodenum. For this study we used a human material of 48 patients equally by both sexes. The material was taken for surgery on the occasion of gastric carcinoma Clinic General Surgery of the Sofia’s University. Complied with the ethical and legal principles established by the Sofia to work with human material. Informed consent was taken from all patients. Dr. Stoyanov made photos of the histological preparations with the courtesy of Centre for Neurodegenerative Diseases, Magdeburg, Germany. Ligamentum suspensorium duodeni is essential morphological and clinical connection, which unfortunately is poorly addressed in the science literature. By all means it is responsible for pain symptoms due to the abundance of nerve fibers and receptors.

Kategorie: Poster

Poster 108:

Titel:Serotonergic, cholinergic and catecholaminergic fiber distribution in the mouse brainstem

Autoren: Morcinek K.(1),Paterno M.(2),Schröder H.(2),

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Abstract:
The role of brainstem serotonergic, cholinergic and catecholaminergic transmission under physiological and pathological conditions is becoming increasingly obvious. A detailed inventory on the distribution of fibers containing these transmitters is important as a comparative basis for transgenic mice studies. For example, serotonin is involved in major depression, acetylcholine in nicotine and cocaine addiction and catecholamines influence gastric motility and anorexia. By means of immunohistochemistry we studied the distribution of serotonergic, cholinergic and catecholaminergic fibers in the mouse (C57BL/6) brainstem, rating the fiber density by semiquantitative evaluation. Highest densities of serotonin-immunoreactive fibers were assessed in the ambiguus nucleus, the parabrachial nucleus and the superior vestibular nucleus. There is evidence that in the ambiguus nucleus serotonin is involved in the innervation of laryngeal muscles and the trigeminocardiac reflex. In the parabrachial nuclei serotonergic mechanisms underlie the regulation of salt appetite. Raphe-vestibular connections as shown in rats are thought to modulate cerebellar input into the vestibular nuclei. Cholinergic fibers showed high densities in the interpeduncular nucleus which is known from rat studies to be the only target of medial habenula cholinergic efferents. Selective postnatal ablation of the medial habenula in transgenic mice leads to reduced acetylcholine levels accompanied by behavioral abnormalities. Tyrosine hydroxylase-immunoreactive fibers, probably axons of the nuclear neurons, were present in high density in the Kölliker-Fuse nucleus which controls upper airway function. The presently collected data will be useful as a wildtype basis for histochemical studies on the mouse brainstem.

Kategorie: Poster

Poster 109:

Titel:Angioscintigraphy and its utility in early diagnosis of neoplasia

Autoren: Moscu M.(1), Fatu C.(1), Fatu A.M.(1), Vascu B.M.(1), Fatu I.C.(2)

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Abstract:
Angio-scintigraphy with Tc-99m-labeled red blood cells is a new technique used to evaluate the dynamics of blood flow in tumoral tissue. Our aim was to find a correlation between the time interval from injection of radionuclide and a positive angiogram in tumors compared to benign lesions. Material and method: We studied 16 cases of hormonal-dependent neoplasia and 6 controls. The radiotracer was Tc 99m-labeled red blood cells, injected at forearm and spread into the blood flow. A gamma-camera detection was used to register the radio-angiogram. Results point out an increased labeled territory associated with an intense capture of radionuclide in malignancies compared with controls. Dose-to-time diagrams were registered to reveal the dynamics of tumoral blood flow. Conclusion: Angio-scintigraphy is a useful technique to discriminate the malignancies from benign lesions in preoperative protocols.

Kategorie: Poster

Poster 110:

Titel:Female genitalia microvascularization – foetal morphology

Autoren: Motoc A.(1),Ilie C.(1),Folescu R.(1),

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Abstract:
Angiographic studies have demonstrated that uterine arteries are always present, regardless of age and obstetric history. Topographic evaluations showed that uterine vessels always cross superficial ureter on both sides. Number of the uterine artery branches pass to the body and the cervix is significantly variable and depends on the age and pregnancies. We have used foetal parts, from female human foetuses of average gestational age to assess the processes of angiogenesis and whether they are guided by the endothelial cell type (ECT). We followed if cytokine receptors such as PDGFR-α CD117/c-kit and are expressed in endothelial tubules microenvironment. 24 pieces were taken post-mortem, from the uterus and fallopian tube from human foetuses of gestational age (4-6 months of gestation). Immunolabeling with anti-CD34 showed microvascular bed morphology of foetal internal genitalia and broad ligament of the uterus. Immunolabeling with anti-desmin was positive in the fallopian tube muscular tunica. Furthermore, myoid desmin-positive cells were identified in the broad ligament of the foetal uterus. Myometrial desmin-positive muscle fibers were highlighted in the foetus uterus too. Vascular muscular layers were imunonegative to desmin. Keywords: desmin, fallopian tube, uterine artery

Kategorie: Poster

Poster 111:

Titel:Haller`s artery – macroscopic and clinical anatomy

Autoren: Motoc A.(1),Ilie C.(1),Folescu R.(1),

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Abstract:
Iliolumbar artery (ILA , artery of Haller) is known as the most powerful nutritional branch of the hip bone. AIL is described as originating from the main trunk of the internal iliac artery (IIA) or from the posterior trunk. As a nutritive resource of the femoral nerve, ILA can also be involved in neuropathic pain syndromes occurring after surgical procedures performed in the iliac fossa, 4-6 cm. superior to the inguinal ligament. For iliolumbar artery study we used 15 adult human cadavers (30 hemipelvises), 9 males and 6 females, dissected for evidence of bilateral iliac arterial system in the pelvis. 20 hemipelvises were fixed in formalin and other 10 anatomy were dissected post autopsy. Ethical regulations have been followed. In addition, iliac arterial system was evaluated retrospectively in a group of 50 patients, performing the iliac conventional angiography. Origin of the iliolumbar artery from the iliac system could be appreciated by dissection, and imaging. ILA was identified in all examined specimens (100%) originating from the common iliac arterial / intern trunk at various levels. We have noticed that if an AIL had a higher origin, its trajectory was more horizontally to the iliac fossa, and if ILA had a low origin, it had an oblique trajectory. Keywords: iliolumbar artery, angiography, iliac fossa

Kategorie: Poster

Poster 112:

Titel:From mice to men: how common is the lipid body-containing interstitial cell in the lungs of various mammalian species?

Autoren: Mühlfeld C.(1),Tahedl D.(1),Tschanz S.(2),Ochs M.(1),

Adressen:(1)Institute of Functional and Applied Anatomy|Hannover Medical School|Hannover|Germany; email:muehlfeld.christian@mh-hannover.de; (2)Institute of Anatomy|University of Bern|Bern|Switzerland

Abstract:
Lipid-body containing interstitial cells, also termed lipofibroblasts, are thought to play a role in various important physiological processes in the mammalian lung, including development, vitamin A storage and surfactant synthesis. However, very little is known about their amount and occurrence in mammalian species. Therefore, lung samples from 14 adult mammalian species and from postnatal mice, rats and humans were investigated by transmission electron microscopy and stereology. Among the adult animals, lipid bodies in interstitial cells of the alveolar septa were observed only but not in all rodents. Similarly, lipid bodies were found in the lungs of postnatal mice and rats but not in humans. In mice and rats, an early postnatal increase of total lipid body volume was observed, followed by persisting lower levels in the adult animals. Thus, our study does not provide evidence for a broad occurrence of lipofibroblasts in mammalian lungs which casts doubt on the physiological impact of this cell type in non-rodent lung function, particularly in humans. However, the postnatal developmental pattern of the volume of lipid bodies confirms the special role of lipofibroblasts during rodent lung development.

Kategorie: Poster

Poster 113:

Titel:Localization and transport of ribosomes and rna in axons of the adult mammalian peripheral and central nervous system

Autoren:Müller K.(1),Vogelaar C.(1),Nitsch R.(1),

Adressen:(1)Universtätsmedizin Mainz|Institut für Mikroskopische Anatomie und Neurobiolgie|Mainz|Germany; email:kerstin.mueller@unimedizin-mainz.de

Abstract:
It is well known that after lesion axons of the peripheral nervous system (PNS) regenerate much better than those of the central nervous system (CNS). One mechanism for the initiation of regeneration is local protein synthesis. This has been shown to take place in peripheral axons since these axons contain all the necessary components like mRNAs and ribosomes. Furthermore it is also known that local protein synthesis is required for the formation of a new growth cone and for the transcriptional response after injury. In the adult mammalian CNS, however, axonal local protein synthesis is still a controversial subject. There are now first indications for the presence of ribosomes in central axons but clear data on ribosome transport in CNS axons are still missing. To visualize the ribosome transport in vivo recombinant adeno-associated viruses expressing the ribosomal protein L4 (RPL4) fused with eGFP (construct provided by Jan van Minnen, Calgary) were made in cooperation with Beat Lutz (Mainz). RPL4 is a component of the large 60S subunit of the ribosome. Additionally, we created the transgenic ‘RiboTracker’ mouse in cooperation with Ari Waisman (Mainz), in which RPL4 fused with tdTomato is preceded by a floxed stop codon, so that this mouse conditionally expresses tdTomato-labeled ribosomes after Cre-mediated recombination. Using these tools we aim to analyze the localization and transport of ribosomes and RNA in axons of the PNS and CNS of the adult mouse, in relation to lesion and regeneration.

Kategorie: Poster

Poster 114:

Titel:Differential rab6 immunolabelling in the hypothalamo-hypophysial tract of adult mice

Autoren: Müller T.(1),Fredrich M.(1),Derouiche A.(1),Korf H.(1),
Adressen:(1)Dr. Senckenbergische Anatomie|Goethe-Universität Frankfurt am Main|Frankfurt am Main|Germany; email:Fredrich@med.uni-frankfurt.de

Abstract:
Rab6 is a member of the rab protein family (ras-like in rat brain). Besides its function in regulation of ER–Golgi trafficking in a retrograde direction, Rab6 can also play a role in constitutive exocytotis. Our initial findings indicated co-expression of Rab6 with arginine-vasopressin (AVP) and oxytocin (Ox) in the hypothalamo-hypophysial tract (HHT), as well as in the suprachiasmatic nucleus (SCN) of mice. Both neurohypophysial hormones are secreted by regulated exocytosis. Therefore, these data might indicate an additional function of Rab6 in regulated exocytosis. We studied the paraventricular nucleus (PVN), the supraoptic nucleus (SON), the median eminence (ME) of the hypothalamus, the pars nervosa (PN) of the pituitary, and the SCN of adult male mice to confirm co-localization of Rab6 with AVP and/or Ox, throughout the HHT. Immunohistochemical triple-labeling for Rab6, AVP and Ox was performed to measure the staining intensities. Our results show a partial co-localization of Rab6 and AVP in the SCN but no Rab6/AVP co-localization in the HHT. Instead, all Rab6-ir cell bodies in PVN and SON contain Ox. Rab6 immunoreactivity is exclusively localized in Ox-containing fibers of the ME as well as in Ox-containing Herring bodies of the PN. In summary our results show that in the hypothalamo-hypophysial system Rab6 is localized exclusively in Ox positive cells. Notably, a minority of the AVP- cells of the SCN were also Rab6 immunoreactive. We conclude that Rab6 might play a role not only in constitutive but also in regulated (non-constitutive) exocytosis.

Kategorie: Poster

Poster 115:

Titel:Differential rab6 immunolabelling in the hypothalamo-hypophysial tract of adult mice

Autoren: Müller T.(1),Fredrich M.(1),Derouiche A.(1),Korf H.(1),

Adressen:(1)Dr. Senckenbergische Anatomie|Goethe-Universität Frankfurt am Main|Frankfurt am Main|Germany; email:Fredrich@med.uni-frankfurt.de

Abstract:
Rab6 is a member of the rab protein family (ras-like in rat brain). Besides its function in regulation of ER–Golgi trafficking in a retrograde direction, Rab6 can also play a role in constitutive exocytotis. Our initial findings indicated co-expression of Rab6 with arginine-vasopressin (AVP) and oxytocin (Ox) in the hypothalamo-hypophysial tract (HHT), as well as in the suprachiasmatic nucleus (SCN) of mice. Both neurohypophysial hormones are secreted by regulated exocytosis. Therefore, these data might indicate an additional function of Rab6 in regulated exocytosis. We studied the paraventricular nucleus (PVN), the supraoptic nucleus (SON), the median eminence (ME) of the hypothalamus, the pars nervosa (PN) of the pituitary, and the SCN of adult male mice to confirm co-localization of Rab6 with AVP and/or Ox, throughout the HHT. Immunohistochemical triple-labeling for Rab6, AVP and Ox was performed to measure the staining intensities. Our results show a partial co-localization of Rab6 and AVP in the SCN but no Rab6/AVP co-localization in the HHT. Instead, all Rab6-ir cell bodies in PVN and SON contain Ox. Rab6 immunoreactivity is exclusively localized in Ox-containing fibers of the ME as well as in Ox-containing Herring bodies of the PN. In summary our results show that in the hypothalamo-hypophysial system Rab6 is localized exclusively in Ox positive cells. Notably, a minority of the AVP- cells of the SCN were also Rab6 immunoreactive. We conclude that Rab6 might play a role not only in constitutive but also in regulated (non-constitutive) exocytosis.

Kategorie: Poster

Poster 116:

Titel:Canonical wnt signaling and the proliferation of neural enteric progenitor cells

Autoren: Neckel P.(1),Zhang Y.(1),Seid K.(1),Mack A.(1),Obermayr F.(2),Hirt B.(1),Just L.(1),

Adressen:(1)Clinical Anatomy and Cell Analysis|Institute of Anatomy|Tübingen|Germany; email:pneckel@anatom.uni-tuebingen.de; (2)Department of Pediatric Surgery|University Children's Hospital Tübingen|Tübingen|Germany

Abstract:
The enteric nervous system (ENS) is a highly complex autonomous network that controls diverse functions of the gastrointestinal tract, ranging from motility, resorption, and water household to immune response. A distinct population of neural cells exhibiting high proliferative capacity was identified in the ENS of rodents and men. We and others have previously shown that these enteric neural progenitor cells can be isolated, expanded, and finally differentiated into neurons and glia cells. In this study, we evaluated the influence of canonical Wnt signaling on proliferation and differentiation of enteric progenitor cells from neonate mice using BrdU-incorporation assays, immunohistochemistry, western blot, and RT-PCR experiments. We demonstrated the expression of Wnt-receptors as well as the intracellular accumulation of the Wnt-dependent beta-catenin. We further showed that stimulation of the canonical Wnt pathway enhanced proliferation and neuronal differentiation of enteric progenitor cells in vitro. These results lay the groundwork for a better understanding of the molecular mechanisms regulating the enteric neural progenitor cell pool. Ongoing and future work will elucidate the impact of canonical Wnt activation on enteric progenitors in vivo as well as the cellular partners involved in progenitor homeostasis in the living animal.

Kategorie: Poster

Poster 117:

Titel:Effects of different superparamagnetic iron oxide nanopartciles on murine primary brain cells

Autoren: Neubert J.(1),Wagner S.(2),Kiwit J.(3),Glumm J.(4),Bräuer A.(5),

Adressen:(1)Institute for Cell Biology and Neurobiology, Center for Anatomy|Charité-Universitaetsmedizin Berlin|Berlin|Germany; email:jenni.neubert@charite.de; (2)Institute for Radiology|Charité-Universitaetsmedizin Berlin|Berlin|Germany; (3)Clinic for Neurosurgery|HELIOS-Klinikum Berlin-Buch|Berlin|Germany; (4)Charité-Universitaetsmedizin Berlin|Institute for Cell Biology and Neurbiology, Center for Anatomy|Berlin|Germany; (5)Charité-Universitätsmedizin Berlin|Institute for Cell Biology and Neurobiology, Center for Anatomy|Berlin|Germany

Abstract:
The physicochemical properties of superparamagnetic iron oxide nanoparticles (IONP) enable their application for diagnostics and therapy of central nervous system (CNS) diseases. However, since crucial information regarding side effects of particle-cell interactions within the CNS is still lacking, we investigated the influence of novel Very Small Iron Oxide Particles (VSOPs) or clinically approved Ferucarbotran or Ferumoxytol on the vitality and morphology of brain cells. We exposed primary cell cultures of microglia and hippocampal neurons as well as to neuron-glia co-cultures to varying concentrations of IONPs for 6 h and/or 24 h, respectively. Here, we show that IONP accumulation by microglia and subsequent morphological alterations strongly depend on the respective nanoparticle type. Microglial viability was severely compromised by high IONP concentrations, except in the case of Ferumoxytol. While Ferumoxytol did not cause immediate microglial death, it induced severe morphological alterations and increased degeneration of primary neurons. Additionally, primary neurons clearly degenerated after VSOP and Ferucarbotran exposure. In neuron-glia co-cultures, IONPs rather stimulated the outgrowth of neuronal processes in a concentration and particle dependent manner. We conclude that the influence of IONPs on brain cells not only depends on the particle type but also on the physiological system they are applied to.

Kategorie: Poster

Poster 118:

Titel:Influence of major kavalaktones kavain, methysticin and yangonin on microglia and astrocytes

Autoren: Neumann J.(1),Lucius R.(1),Spreu J.(1),Rickert U.(1),

Adressen:(1)Department of Anatomy|University of Kiel|Kiel|Germany; email:u.rickert@anat.uni-kiel.de

Abstract:
Neuroinflammation is a growing field of CNS research, as a chronic state of local innate immune overactivation contributes to the deterioration of some of the most important neurological diseases like Alzheimer's disease and Parkinson's disease (PD). The massive quest for new drugs that ameliorate these processes yielded many candidate molecules, yet the perfect substance has not been found. Kava is a herbal remedy from oceania made of the roots of Piper methysticum. It became popular for its relaxing and anxiolytic properties in the late nineties. We examined the effects of purified major kava constituents kavain, methysticin and yangonin on levels of essential molecular inflammatory players iNOS, IL-6, IL-1 beta and TNF-alpha and their ribonucleic predecessors in primary microglia and astrocytes that were activated with bacterial endotoxin (LPS). Furthermore we investigated cytotoxicity, nitric oxide production and signaling cascades possibly involved. In short, kavain and methysticin significantly decreased levels of the aforementioned inflammatory players in microglia after 6 and 24 hours of incubation. Yangonin induced a highly significant reduction of IL-1 beta at both time points in microglia and astrocytes. None of the kavalactones displayed significant cytotoxicity, but all substances were able to inhibit the ERK1/2 signaling pathway in microglia. Administration of these major kavalactones modifies neuroinflammatory processes in a potentially beneficial way and thus could be a promising strategy to alleviate neurodegenerative diseases such as PD.

Kategorie: Poster

Poster 119:

Titel:Unique insights into the early spatiotemporal differentiation and organization of the human hearing organ

Autoren: Pechriggl E.(1),Bitsche M.(1),Rask-Andersen H.(2),Blumer M.(1),Fritsch H.(1),Schrott-Fischer A.(3),

Adressen:(1)Department of Anatomy, Histology and Embryology, Division of Clinical and Functional Anatomy, Medical University of Innsbruck|Division of Clinical and Functional Anatomy|Innsbruck|Austria; (2)Departments of Otolaryngology|Uppsala University Hospital|Uppsala|Sweden; (3)Departments of Otolaryngology|Medical University of Innsbruck|Innsbruck|Austria

Abstract:
Studies about the formation of the human cochlea are rare, due to the accessibility of specimens, so that most of the investigations are performed on mice models. By means of immunohistochemical and transmission electron microscopic techniques we investigated an uninterrupted series of unique specimens from gestational week 8 to week 12. We are able to demonstrate for the first time, that onset of innervation starts at embryonic week 8 followed by afferent synaptogenesis at week 11. We identified PAX2 as an early marker for hair cell differentiation. We can report glutamine synthetase-positive peripheral glial cell at the beginning of week 8. We demonstrate the maturation of the spiral ganglion neurons by utilization of the transcription factor MAF B. Early presence of tyrosine hydroxylase gives a strong hint to inward currents of uncoordinated action potentials. This study provides extended and exclusive insights in the early human cochlear maturation.

Kategorie: Poster

Poster 120:

Titel:Muscle spindles in the human superficial perineal muscles

Autoren: Peikert K.(1),May C.(1),

Adressen:(1)Anatomy|TU Dresden|Dresden|Germany; email:Albrecht.May@tu-dresden.de

Abstract:
Although muscle spindles play an important role for the neuronal regulation of striated muscles, some muscles are described as lacking those proprioceptors, among them the bulbospongiosus and ischiocavernosus muscles. In a first approach a screening for muscle spindles was performed in three specimens of each muscle. The specimens were obtained from four human cadavers (one female, three male, mean age 78.3 Â± 11.2 years). Serial sections of the complete muscles were stained with hematoxylin and eosin. In contrast to literature, spindles were detected consistently in both muscles (1-8 spindles in each muscle). However, the mean relative abundance of Banks was very low (0.13 in ischiocavernosus, 0.07 in bulbospongiosus muscle). This finding supports physiological models of pelvic floor regulation. In a second approach the spindles were characterized using antibodies against podocalyxin, myosin heavy chain isoforms (MyHC-slow tonic, S46; MyHC-2a/2x, A4.74), caveolin 1, and neurofilament. A total number of 26 muscle spindles were evaluated. They showed normal spindle morphology (a fibro-cellular inner and outer capsule, prominent nerves with their perineural sheath continuing in the outer muscle spindle capsule, vessels entering the capsule and forming a separate capillary bed, nuclear bag and nuclear chain fibers) but contained of few intrafusal fibers (mean of 3.1 fibers; range: 1-7 fibers). The low muscle spindle abundance and fiber number might point to a minor level of proprioceptive regulation.

Kategorie: Poster

Poster 121:

Titel:Zinc biology of neurons generated from human ips cells of controls and phelan-mcdermid syndrome patients

Autoren: Pfaender S.(1),Achberger K.(1),Putz S.(1),Udvardi P.(1),Foehr K.(2),Liebau S.(3),Grabrucker A.(4),Boeckers T.(1),

Adressen:(1)Institute for Anatomy and Cell Biology|Ulm University|Ulm|Germany; email:stefanie.pfaender@uni-ulm.de; (2)Institute for Clinical Anesthesiology|Ulm University Hospital|Ulm|Germany; (3)Institute of Neuroanatomy|Eberhard Karls University Tübingen|Tübingen|Germany; (4)Neurocenter|Ulm University|Ulm|Germany

Abstract:
ProSAP/Shank molecules are important scaffolding proteins in the postsynaptic compartment of excitatory synapses. They build platforms linking components of the postsynaptic signaling apparatus to the actin-based cytoskeleton. Thus, they build a framework for the formation of the postsynaptic density (PSD). Interestingly, two of the three ProSAP/Shank family members are targeted to and regulated at the PSD via their sterile alpha motif which is essential for protein assembly by binding to zinc ions. A role for ProSAP/Shank proteins in neurodegenerative diseases was first proposed when a deletion in the q13 region of chromosome 22, where the ProSAP2 gene is located, was identified as the main genetic cause for Phelan-McDermid Syndrome (PMDS). This syndrome is characterized by features of autism spectrum disorders along with hypotonia and mental retardation. Intriguingly, an association of autism spectrum disorders with zinc deficiency in children was already shown and imbalances in zinc homeostasis have been associated with multiple brain disorders. Thus, here, we investigate the effects of zinc supplementation and depletion on the differentiation and synaptogenesis of neurons differentiated from human induced pluripotent stem cells. Moreover, we will use PMDS patient derived stem cells to evaluate, if zinc supplementation could be a possible treatment strategy for PMDS. In a first set of experiments we therefore evaluated expression of zinc homeostasis proteins of neurons differentiated from patient derived and control stem cells. Furthermore we examined morphology and function of these cells. Thus, indeed, zinc seems to be an important factor in neuro- and synaptogenesis and future stem cell based experiments will hopefully provide further evidences.

Kategorie: Poster

Poster 122:

Titel:Does vagus nerve branching influence the success of vagus nerve stimulation?

Autoren: Planitzer U.(1),Glaetzner J.(2),Tillmann B.(3),Meixensberger J.(2),Winkler D.(2),Hammer N.(1),

Adressen:(1)Institut für Anatomie|Universität Leipzig|Leipzig|Germany; (2)Neurosurgery|Universität Leipzig|Leipzig|Germany; (3)Anatomisches Institut|Christian-Albrechts-Universität zu Kiel|Kiel|Germany

Abstract:
Background Vagus nerve stimulation (VNS) is increasingly applied to treat epilepsy, psychiatric conditions and chronic heart failure. After implanting VNS electrodes to the cervical vagus nerve (CVN), side effects such as voice alterations and dyspnea or missing therapeutic effects are observed at different frequencies. CVN branching might partly be responsible for these effects. However, CVN branching has not yet been described in the context of VNS. Materials and Methods Branching of the CVN was investigated macroscopically in 35 body donors (66 cervical sides) in the carotid sheath. After X-ray imaging for determining the vertebral levels of CVN branching, samples were removed to histologically prove the nerve and to calculate CVN diameters and cross-sections. Results CVN branching was observed in 29% of all cases (26% unilaterally, 3% bilaterally) and proven histologically in all cases. Right-sided branching (22%) was more common than left-sided branching (12%) and occurred on the level of the fourth and fifth vertebra on the left and on the level of the second to fifth vertebra on the right side. CVN without branching were significantly larger than CVN with branches, concerning their diameters (4.79 mm vs. 3.78 mm) and cross-sections (7.24 mm2 vs. 5.28 mm2). Discussion CVN branching is considerably more frequent than described previously. The side-dependent differences of CVN branching may be linked to the asymmetric effects of the vagus nerve. CVN branching should be taken into account when identifying main trunk of the CVN for implanting VNS to minimize potential side effects or lacking therapeutic benefits.

Kategorie: Poster

Poster 123:

Titel:Steroid hormone binding globulins in the vomeronasal organ

Autoren: Ploss V.(1),Gebhart V.(1),Dölz W.(1),Jirikowski G.(1),

Adressen:(1)Anatomie II|Klinikum der FSU Jena|Jena|Germany;
email:Gustav.Jirikowski@med.uni-jena.de

Abstract:
Gonadal and adrenal steroid hormones are known to be powerful olfactory ligands. They seem to affect the limbic system primarily through the vomeronasal organ (VNO). The underlying cellular and molecular mechanisms are unclear so far. Recently we found that sex hormone binding globulin (SHBG) and corticosteroid binding globulin (CBG) are expressed in the rat olfactory system. Here we examined with immunocytochemistry and with RT-PCR SHBG and CBG expression in the VNO of rat and of human. In semithin sections we found SHBG and CBG immunostaining confined to the apical parts of sensory cells and in their axons. A portion of the basal cells and some of the goblet cells in the non-sensory epithelium showed intense staining for either of the steroid binding globulins. Colocalization of both antigens was observed in some of the VNO cells as revealed by staining of consecutive semithin sections. SHBG and CBG staining was most abundant in exocrine cells of the vomeronasal glands. Our findings indicate that steroid binding globulins expressed in the VNO may be released into nasal secretions to bind pheromones. SHBG and CBG in sensory cells may be involved in signaling actions of aerosolic steroids thus facilitating their pheromone actions.

Kategorie: Poster

Poster 124:

Titel:Effects of ciprofloxacin and phenylacetic acid on human tenocytes in vitro

Autoren: Popowski E.(1),Kohl B.(1),Schneider T.(1),Ertel W.(1),Schulze-Tanzil G.(1),

Adressen:(1)Department for Orthopaedic, Trauma and Reconstructive Surgery|Charité-University of Medicine, Campus Benjamin Franklin|Berlin|Germany; email:erman.popowski@fu-berlin.de

Abstract:
Several cases of tendinopathy in patients treated with fluoroquinolone antibiotics or suffering from chronic renal failure have been described. Dysregulated integrins and matrix metalloproteinases (MMPs) have previously been implicated in tenotoxicity of fluoroquinolones. The aim of the present study was to investigate the effect of the uremic toxin phenylacetic acid (PAA) and a possible synergism with the fluoroquinolone ciprofloxacin (CPX) on tenocytes. Primary human tenocytes were treated with CPX or PAA alone or in combination. Tenocyte metabolic activity was evaluated using the AlamarBlue-Assay. Real-time detection-polymerase chain reaction (RTD-PCR) was used to evaluate the gene expressions of MMP-1 and integrin beta 1 (ITGB1). After being treated with a concentration of CPX (3, 10, 30, 100 mg/L) for 8 hours the cell activity was decreased to 85.97%, 76.57%, 71.05% and 61.26% of that in the control. In contrast, PAA did not cause any significant changes in cell viability at the tested concentrations (3.5, 5.0, 10, 50 mM). The results of RTD-PCR revealed that MMP-1-expression remained unchanged after exposure to PAA (3.5, 10 mM) whereas concentrations of 10 and 30 mg/L CPX up-regulated the expression of MMP-1. This effect became more pronounced following exposure of a combination of CPX (10 mg/L) and PAA (10 mM). However, CPX and PAA as well as their combination did not affect gene expression of ITGB1 significantly. These findings demonstrate a potential adverse effect of the combination of a fluoroquinolone and a uremic toxin on human tenocytes in vitro for the first time.

Kategorie: Poster

Poster 125:

Titel:Tgf-beta system in enteric nerves and muscles: expression of ligands and receptors and effects on differentiation of smooth muscle cells

Autoren: Porschek S.(1),Wedel T.(1),Barrenschee M.(1),Lange C.(1),Egberts J.(2),Becker T.(2),Böttner M.(1),

Adressen:(1)Department of Anatomy|Christian-Albrechts University of Kiel|Kiel|Gernany; email:s.porschek@gmx.de; (2)Department of General, Thoracic, Transplantation and Pediatric Surgery|University Hospital Schleswig-Holstein, Campus Kiel|Kiel|Gernany

Abstract:
Background: Transforming growth factor-betas (TGF-betas) are pleiotropic cytokines that regulate growth, differentiation and survival of various cell types. We recently characterized TGF-beta2 as a neurotrophic factor for enteric neurons. To further elucidate putative effects of the TGF-beta system on intestinal nerves and muscles, TGF-beta ligands and receptors were analyzed in human intestine and enteric cell culture systems. Effects of TGF-beta1 on differentiation of enteric smooth muscle cells were monitored in vitro. Material and methods: mRNA expression of TGF-beta1, beta2, beta3 and the receptors TbetaR-1, TbetaR-2, TbetaR-3 were studied (qPCR) in samples of human colon (separated intestinal layers, laser-microdissected myenteric ganglia) and in cultured rat myenteric neurons and smooth muscle cells. Cultured smooth muscle cells were exposed to TGF-beta1 (2/10/50 ng/ml) and gene expression (qPCR) of smoothelin, smooth-muscle-actin (SMA), muscarinergic receptors (M2R, M3R) and glial cell line-derived neurotrophic factor (GDNF) was determined. Results: TGF-beta ligands and their receptors were expressed in all human colonic wall layers including LMD-isolated ganglia. All components of the TGF-beta system were also detectable in cultured rat myenteric neurons and smooth muscle cells. The effect of TGF-beta1 treatment resulted in increased mRNA expression of SMA, M2R, M3R, and GDNF compared to controls. Conclusions: All components of the TGF-beta system are abundantly expressed both in the human colon and cultured rat enteric neurons and smooth muscle cells arguing for potential trophic and differentiation effects on enteric nerves and musculature. Thus, an impaired TGF-beta system may compromise intestinal neuromuscular functions thereby contributing to the pathogenesis of intestinal motility disorders.

Kategorie: Poster

Poster 126:

Titel:Function of microrna-9 for the development of chick midbrain

Autoren: Prem Anand A.(1),Huber C.(2),Leucht C.(3),Hirt B.(4),Wizenmann A.(4),

Adressen:(1)Clinical Anatomy and Cell Analysis|institute of Anatomy, University of Tübingen|Tübingen|Deutschland; (2)Clinical Anatomy and Cell Analysis|Institute of Anatomy,University of Tübingen|Tübingen|Germany; (3)Roche Custom Biotech/Biochemical Reagents|Roche Diagnostics GmbH|Penzberg|Germany; (4)Clinical Anatomy and Cell Analysis|Institute of Anatomy, University of Tübingen|Tübingen|Germany

Abstract:
Neuronal networks form during embryonic development through the generation of a sophisticated pattern of CNS regions, neurones and their axons. Intricate molecular networks tightly control these processes. MicroRNAs (miRs) are small non coding RNAs and form a new layer of regulating gene and protein expression in the developing and adult brain and in many other organ systems. They have been shown to be involved in almost all neural events - proliferation, neurogenesis, dendritic morphogenesis, axonal growth and synaptic plasticity. There is accumulating evidence that miR malfunction contributes to neural and behavioural disorders and neurodegenerative diseases. However, how miRs influence different aspect of brain development is only just unravelling. We investigated expression and function of miR-9 for chick midbrain development by analysing regional gene expression and neuronal differentiation in the chick embryo. Our analysis showed a dynamic pattern of miRNA9 expression. Early in development, miRNA9 is diffusely expressed in the entire brain (embryonic day 2) and becomes more restricted to specific areas of the CNS in later stages (E3-E6). MiR-9 gain of functions studies in the mid-hindbrain boundary (MHB) showed premature neural differentiation and often evoked smaller brains. Our results so far suggest that miRNA9 is important for the early maintenance of the MHB and growth of the midbrain similar to it’s role in zebrafish (Leucht et al. 2008, Nat Neursci) .

Kategorie: Poster

Poster 127:

Titel:Influence of tissue fixation with formalin on different cell biologically relevant macromolecules

Autoren: Preuße-Prange A.(1),Modrow J.(2),Schwark T.(2),von Wurmb-Schwark N.(2),

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Abstract:
The investigation of formalin-fixed and paraffin embedded tissue is a commonly used method for medical studies. Since these samples are usually stored for decades they provide a unique tissue bank for different scientific issues. However, several reports show that formalin affects macromolecules and thus might hamper reliable and reproducible molecular experiments. In previous examinations the different macromolecules (nuclear DNA, mitochondrial DNA, inclusive the 4977 Deletion and proteins) have never been analyze simultaneously in the same experimental approach. This systematical study aims to investigate whether it is possible to obtain reliable genetic results out of formalin-fixed samples with special regards to different incubation times. For this purpose post mortem tissue samples (cerebrum and cerebellum) of six different individuals were sampled (148 samples) and exposed to formalin for different durations (30 minutes - 3 months). After incubation we quantified nuclear DNA, mitochondrial DNA, deleted mitochondrial DNA and conducted a short tandem repeat analysis of all samples using the commercial Powerplex®-ESX-kit. We also performed protein analysis by immunohistochemistry and Western blot (detect and quantify members of the HSP70) on all samples. Our results show that the content of mitochondrial DNA as well as the amount of deleted mitochondrial DNA is inversely proportional with increasing formalin incubation time. Further the results show that already after 30 minutes of formalin-fixation no proteins could be reliably detected using Western blotting while reproducible immunhistochemical detection was possible even after one month of fixation. These fixation time-dependent alterations could lead to problems and wrong results in scientific research.

Kategorie: Poster

Poster 128:

Titel:Nrf2 regulates sox9: a potential role for cartilage regeneration

Autoren:Pufe T.(1),Jahr H.(2),Claudius C.(3),Beckmann R.(1),Tohidnezhad M.(1),Wruck C.(1),

Adressen:(1)Anatomy and Cell Biology|RWTH Aachen University|Aachen|Germany; email:tpufe@ukaachen.de; (2)Orthopaedic Surgery|RWTH Aachen University|Aachen|Germany; (3)Anatomie and Cell Biology|RWTH Aachen University|Aachen|Germany

Abstract:
Cartilage injury often results in osteoarthritis. Articular cartilage has a poor healing potential. Aim of the present Study was to investigate the influence of Nrf2 on Sox9 which is important for cartilage regeneration. For the current study we used Nrf2 and KEAP1 KO, histology, immunofluorescence, Real Time RT PCR, dual luciferase and proliferation assays and promoter studies. Knock Out studies revealed a decrease of Sox9 in cartilage of Nrf2 KO animals. Nrf2 KO decreases and KEAP1 KO increases Sox9 mRNA in C28/I2 chondrocytes. Dual luciferase assay revealed an activation of Sox9 due to Nrf2 inducers. The Nrf2 inducer Methysticin leads to an increase of proliferation in C28/I2 wildtype cells. In this ongoing study we could reveal for the first time that Nrf2 activation leads to an increase of Sox9 and a subsequent increase of proliferation. Future investigations are needed to reveal the therapeutic potential of Nrf2 in treatment of osteoarthritis.

Kategorie: Poster

Poster 129:

Titel:Changes in metabolic profile of skeletal muscle fibres of apoe-deficient mice

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Abstract:
Changes in metabolic profile of skeletal muscle fibres of ApoE-deficient mice Karla Punkt1 , Katharina Boltz1, Volker Adams2, Sabine Löffler1 1 Institute of Anatomy, University of Leipzig, 2 Heart Center, University of Leipzig Elevated levels of angiotensin II (Ang-II) are associated with the development of atherosclerosis. Nothing is known about metabolic alterations in the skeletal muscle due to Ang-II and exercise training(ET). We investigated metabolic changes in skeletal muscle fibres due to Ang-II and ET. Osmotic mini-pumps were used to infuse Ang-II (n=20) or NaCl (n=10) into ApoE deficient mice (n=20). Half of the Ang-II infusion mice (n=10) were also exercise daily on a treadmill during Ang-II infusion. After 4 weeks skeletal muscles were removed and analysed by means of cytophotometry for fibre type specific changes of glycolytic (GPDH) and oxidative (SDH) enzyme activities. The results differed in soleus muscle (SOL) as an endurance muscle and extensor digitorum longus muscle (EDL) as a fast force muscle. In SOL mainly the SDH activity changed while the GPDH activity remained nearly unchanged, in contrast to EDL which showed the opposite effect. In both muscles, the FOG fibres (fast fibres with both oxidative and glycolytic metabolism) were the most affected fibre type. The FOG fibres of untrained ApoE mice with Ang-II infusion showed to 50% decreased enzyme activities compared to ApoE mice without Ang-II infusion, suggesting the muscles of ApoE mice may be stronger diseased after Ang-II infusion. The training antagonized this effect, indicating a beneficial effect of training on muscles of ApoE mice.

Kategorie: Poster

Poster 130:

Titel:Akap220 and akap12 contribute to endothelial barrier regulation via compartmentalization of pka

Autoren: Radeva M.(1),Kugelmann D.(1),Spindler V.(1),Waschke J.(1),

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Abstract:
cAMP- mediated PKA signaling is a central pathway involved in maintenance of endothelial barrier properties. Tight regulation of PKA function can be achieved by discrete compartmentalization of the enzyme via physical interaction with A-kinase anchoring proteins (AKAPs). Here, by using human and mouse microvascular endothelial cells, we investigated the role of AKAP220 and AKAP12 in endothelial barrier regulation. Besides treatment with TAT-Ahx-AKAPis peptide, designed to competitively inhibit PKA-AKAP interaction, application of AKAP- specific siRNAs was carried out. Transendothelial electrical resistance measurements showed that TAT-Ahx-AKAPis not only destabilized endothelial barrier properties but also impaired barrier formation. The latter effect was more pronounced than the one observed as result of specific AKAP12 and 220 down-regulation indicating that likely more than these two AKAPs are involved in this process. Furthermore, we showed that depletion of AKAP12 but not of AKAP220 is important for cAMP-mediated endothelial barrier stabilization. We also observed that simultaneous depletion of AKAP12 and AKAP220 but not depletion of a single AKAP reduced cAMP-mediated Rac1 activity, which is indicative for the redundant function of those AKAPs in regulation of Rac1 activity. Taken together, these results demonstrate that AKAP-mediated PKA subcellular compartmentalization is involved in endothelial barrier regulation. More specifically, AKAP220 and AKAP12 contribute to endothelial barrier formation and AKAP12 is required for cAMP-mediated barrier stabilization.

Kategorie: Poster

Poster 131:

Titel:Computational modeling and simulation of the novel surfactant proteins sp-g and sp-h

Autoren: Rausch F.(1),Brandt W.(2),Schicht M.(1),Bräuer L.(1),Paulsen F.(1),

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Abstract:
Originally discovered in the pulmonary system, surfactant proteins (SPs) are very important for the stability and flexibility of lipid layer systems on air-fluid interfaces. Furthermore, several representatives of this protein family are responsible for immunological functions. For that reason, SPs are of great interest in the investigation of several diseases and pathologies. Recently, the sequences of the two novel putative surfactant proteins SP G (SFTA2) and SP H (SFTA3) were identified. To characterize both proteins and obtain first insights into their function, protein structure models were generated with methods of computational modeling. Enabled by these protein models, specific antibodies against SP-G and SP-H could be designed and established. Subsequent immunohistochemical studies led to the localization of both proteins in different human tissues, including lung and ocular system. Both protein models were transferred into a virtual lung surfactant model system for molecular dynamics simulations. During these calculations, it was possible to track the accumulation of the proteins to the lipid layer and observe the interactions between protein surface and lipids on an atomic scale. The results indicate that SP-G and SP-H seem to belong to the group of human surfactant proteins that are present in different tissues and may be capable of surface-regulatory properties. In combination with further experimental work, these simulations can help to determine the functions of SP-G and SP-H.

Kategorie: Poster

Poster 132:

Titel:Neurotrophic factor signalling in shank mutant mice

Autoren: Reim D.(1),Baumann B.(2),Wirth T.(2),Boeckers T.(1),Schmeisser M.(1),

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Abstract:
Autism spectrum disorders (ASD) affect approximately 1 percent of the human population. Diagnosis is based on two core clinical features, including impaired social interaction and repetitive/stereotypical behaviour. ASD is generally associated with a dysfunction of synaptic circuits and frequently originates from a genetic cause. In this context, ASD patients have been found, exhibiting genetic mutations in either member of the Shank family - Shank1, Shank2 and Shank3. These proteins build up a huge scaffold at the postsynaptic density (PSD) of excitatory synapses and serve as adaptors for numerous synaptic components, therefore being a core scaffold for proper synaptic signalling and function. To explore the molecular consequences of Shank mutations, we started to investigate the molecular composition of synapses in Shank mutant mice, representing models for ASD. Since levels of neurotrophic factors of ASD patients are reported to diverge from healthy controls, we started to analyze neurotrophic factor signalling in Shank mutant mice, with a special focus on the neurotrophin family and insulin-like growth factors 1 and 2. We found interesting alterations in the levels of neurotrophic factors as putative consequences of genetic Shank deficiency in our mutants. These findings suggest a critical role of aberrant neurotrophin signalling in Shank mutants and support further in-depth analysis.

Kategorie: Poster

Poster 133:

Titel:Dermal arteries of the nailfold of the human thumb

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Abstract:
Recent studies showed that the dermal arties of the human thumb pad do not form a superficial dermal plexus. Instead they ramify treelike and supply blood to discrete skin units. This study aimed at researching whether the blood supply to the skin of the radial and ulnar nailfold also is organized in vascular units. Using 4 millimeter biopsy punches a total of 12 skin biopsies (6 ulnar and 6 radial) were harvested from the proximal nailfolds of the thumbs of six body donors aged between 70 and 92 years. From each biopsy, we created digital volume data (voxel size 1.07 x 1.07 x 2 micron3) by using the High Resolution Episcopic Microscopy (HREM) technique and virtual 3D models of the arteries and arterio-arterial anastomoses (AAA). For the sake of comparability, we only analyzed the topology of the arteries and the number of AAAs in a pre-defined virtual volume of 2 x 2 x 4 millimeter3. In all specimens discrete dermal arteries originated from large subcutaneous arteries and ramified treelike within the dermis. An average of 4.17 AAAs connected branches of these arteries. No superficial arterial plexus could be detected. Statistics revealed no significant differences in the number of anastomoses between the biopsies harvested from radial and ulnar. Our results show that the concept of vascular units is not restricted to the thumb pad, but that blood supply to the lateral nailfold of the thumb is organized in vascular units.

Kategorie: Poster

Poster 134:

Titel:Antibodies directed to neisseria gonorrhoeae crossreact with human choroid plexus in post mortem brain samples and hibcpp choroid plexus papilloma cells

Autoren:Reuss B.(1),Schroten(2),Ishikawa(3),Asif(4),

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Abstract:
First trimester maternal infections with the Gram-negative bacterium Neisseria gonorrhoeae (NG), significantly increase the offspring to develop schizophrenic psychosis in later life (1,2). We investigated here interactions of a polyclonal antiserum directed to NG (alpha-NG) with choroid plexus epithelial cells in human post mortem tissue, and HIBCPP-cells, a human choroid plexus papilloma cell line, an established in vitro model for human choroid plexus epithelium and blood CSF barrier. As shown by immunocytochemistry, alpha-NG reveals a distinct and cell type specific signal in human choroid plexus epithelial cells, which is detectable in a similar manner in HIBCPP-cells. As revealed by Western blot analysis, a distinct 60kDa band could be detected in HIBCPP cells, as well as several weaker bands of different molecular weights. Two dimensional Western blot confirmed these results, revealing crossreactivity of alpha-NG with a set of distinct protein spots, some of which could be identified by mass spectrometric analysis as mitochondrial heat shock protein 60, and ATP synthase subunit beta, as well as the cytoplasmic proteins Retinal dehydrogenase 1, and T-complex protein 1, subunit beta. To our knowledge this is the first report on cross-reactivity of alpha-NG specific antibacterial antibodies with specific cellular target proteins in human choroid plexus epithelial cells. Further experiments will have to clarify functional and pathogenetic relevance of these interactions, with a special focus on a putative role for impaired brain development and functioning in neuropsychiatric disorders like schizophrenia. (1, Babulas et al., 2006, Am. J. Psychiatry 163, 927-929, 2, Sørensen et al., 2009, Schizophrenia Bull. 35, 631-637)

Kategorie: Poster

Poster 135:

Titel:Improved imaging of temporal bone anatomy by high resolution ct using a flat panel detector system

Autoren: Riabikin O.(1),Serowy S.(1),Rostalski D.(2),Vorwerk U.(2),Gugel S.(3),Boese A.(3),Paukisch H.(1),Eppler E.(1),Beuing O.(1),Redel T.(4),Kyriakou Y.(4),Skalej M.(1),

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Abstract:
Modern surgical approaches in the middle and inner ear demand for excellent imaging modalities for treatment planning and simulation, intraoperative navigation and postoperative control. Because enabling higher spatial resolution as compared to multi detector CT scanners (MDCT), flat panel C-arm CT systems improve the ability to image the small structures of the middle and inner ear. Our aim was to compare a new prototype high resolution mode and a standard resolution mode of a flat panel C-arm system for the ability to identify delicate bony and soft tissue structures within the temporal bone. Twenty-five temporal bone specimens were scanned with the Artis zeego flat panel C-arm system (Siemens AG, Healthcare Sector, Forchheim, Germany) multi axis system using a standard and the prototypic high resolution mode. Using reconstruction done in 2 planes, one parallel to the tympanic membrane and the other to the stapes crura, 3 neuroradiologists and a cochlear implant specialist rated the visibility of 13 osseous and soft tissue structures on standard and high resolution images. Altogether, improved visibility by the high resolution mode was achieved in both planes, particularly regarding soft tissue structures which have been reported to be difficult to visualize in the literature. The feasibility of high resolution imaging was obvious in most structures regardless of the reader. Our study documents the superiority of the high resolution mode over the standard mode in flat panel detector systems for temporal bone imaging with regard to middle and inner ear structures, particular in soft tissue.

Kategorie: Poster

Poster 136:

Titel:Cutometer-based measurements – an objective method to evaluate the tissue quality of microvascular flaps raised from cadavers

Autoren: Rieth S.(1),Gleiser C.(2),Schauer J.(2),Krimmel M.(3),Reinert S.(3),Hirt B.(2),

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Abstract:
Raising microvascular flaps requires profound knowledge of the human anatomy and manual skills. An appropriate method to fulfill these requirements is to train surgical skills on human cadavers. The preservation method is a crucial factor for a reliable exposure of anatomical structures. Recent studies evaluating the tissue quality of cadavers are using subjective methods to assess different embalming methods. Non-standardized questionnaires and a high variance of sample size make these studies difficult to compare. In our study, we evaluated the tissue quality of cadavers embalmed with formaldehyde or ethanol/glycerin in comparison to fresh cadavers. The tissue quality of microvascular flaps has been evaluated by the visual analogue scale (VAS) as a widely accepted method to meet the scientific quality criteria for subjective evaluations. As an alternative and objective method we established measurements of skin-elasticity performed with the cutometer (Courage + Khazaka). Both methods are suitable to rate the tissue quality of embalmed cadavers and generate comparable results. The cutometer measurements are valid, reliable and objective. Therefore we suggest that the cutometer measurements are suitable for prospective and non-invasive evaluations of the soft-tissue quality of cadavers.

Kategorie: Poster

Poster 137:

Titel:The meniscofemoral ligaments in reference to the posterior cruciate ligament in different phases of life

Autoren: Röhrich S.(1),Hirtler L.(1),

Adressen:(1)Department for Systematic Anatomy|Center for Anatomy and Cell Biology of the Medical University of Vienna|Vienna|Austria;
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Abstract:
Purpose: The morphology of the meniscofemoral ligaments and the posterior cruciate ligament varies during different stages of life. This study shows those alterations and highlights the age in which the change to the anatomy occurs. Material and methods: Retrospective study of 342 knee MRIs. The patients were allocated to five age groups depending on their respective age at the date of examination. The main focus laid on the incidences, the length and the cross-sectional area of the meniscofemoral ligaments and their relationship to the posterior cruciate ligament in different phases of life. Results: The MFLs are present in the vast majority of people and can be seen as part of the normal human anatomy. Above the age of 10 years, there is no significant difference in the incidence of the MFLs. Length growth of the MFLs is concluded below the age of 11 years, but the MFLs still keep increasing in cross-sectional area. Single MFLs are significantly larger in cross-sectional area than the same MFL in knees with both MFLs present. The cross-sectional area of the PCL is significantly larger if the pMFL is missing. Conclusion: The MFLs of the human knee are non-dispensable structures working in synergy with other elements of the knee joint, especially the PCL. Absence is compensated by the other, present MFL or by the PCL through larger than average morphometrics. Further studies need to be conducted to ascertain if simple absence of the MFLs without compensation may be correlated with pathologies of the knee joint.

Kategorie: Poster

Poster 138:

Titel:Mechanistic insights into nimodipine-mediated neuroprotection in experimental autoimmune encephalomyelitis

Autoren: Rottlaender A.(1),Kuerten S.(1),

Adressen:(1)Anatomy and Cell Biology|University of Würzburg|Würzburg|Germany; email:andrea.rottlaender@uni-wuerzburg.de

Abstract:
Common therapeutic strategies in multiple sclerosis (MS) research aim at modulating the immune response, but do not provide persistent prevention of neurodegeneration. To gain insight into the mechanisms that could mediate neurodegeneration, experimental autoimmune encephalomyelitis (EAE) - the most widely used animal model of MS - is used by our research group. Our previous studies have demonstrated a neuroprotective effect of the L-type calcium channel antagonist nimodipine in relapsing-remitting EAE. Here we plan to investigate the underlying mechanisms of nimodipine-mediated neuroprotection in MP4-induced EAE, using western blot, immunohistochemistry and quantitative real-time PCR. We set out to examine pro- and anti-inflammatory factors including iNOS, arginase-1 and MHC-II but also proteins that are known to mediate neurodegenerative pathology such as the amyloid precursor protein (APP) and caspase-3. Additionally, we plan to examine the effect of nimodipine on human and murine microglia cell cultures to get information about its effect on microglial signaling. For this purpose, we will make use of calcium-measurements and imaging. Moreover, glutamate and TNF-Î±/IFN-Î³-induced toxicity on microglia will be examined by measuring concentrations of lactate dehydrogenase, caspase-3, iNOS, APP and superoxide in the supernatant of microglia cell cultures at different time points. As nimodipine seems to be the only neuroprotective dihydropyridine calcium channel antagonist we are going to compare our results to different antagonists of this group. Taken together, our study is designed to reveal the mechanisms underlying nimodipine-mediated neuroprotection so that new therapeutic strategies for MS patients can be developed in the future.

Kategorie: Poster

Poster 139:

Titel:Glatiramer acetate modulates the cns antigen-specific b cell response in a subpopulation of patients with multiple sclerosis

Autoren: Rovituso D.(1),Kaiser C.(2),Schroeter M.(2),Kuerten S.(1),

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Abstract:
Multiple sclerosis (MS) is a chronic, inflammatory demyelinating disease of the central nervous system (CNS) characterized by an initial inflammatory phase, followed by demyelination and neurodegeneration. It has been discussed if the disease follows a two-stage progression. Studies of early active MS lesions reported heterogeneity in the patterns of demyelinating plaque pathology. The most frequently found pattern was selectively associated with immunoglobulin and complement deposition. It was also shown that the antibody status was predictive of the second clinical episode within three years after the first demyelination event. We aimed to evaluate if treatment with the first-line drug glatiramer acetate (GA) had an impact on autoreactive antibody production. To this end, we stimulated peripheral blood mononuclear cells (PBMC) of GA-treated patients with relapsing-remitting MS (RRMS) and analyzed their B cell response to brain antigens using the enzyme-linked immunospot assay (ELISPOT). We found an association between treatment duration and the time since the last relapse only in patients that displayed CNS antigen-reactive B cells in the blood. In these patients we also observed a significant inverse correlation between the CNS antigen-specific B cell response and the time that passed since last relapse. In addition, RRMS patients with a mild Expanded Disability Status Scale (EDSS) score from 0 to 2.5 displayed lower autoreactive B cell responses than RRMS patients with an EDSS score between 3 and 6. Our data support the notion that the B cell response status could be predictive of relapses and might help to define GA-responders.

Kategorie: Poster

Poster 140:

Titel: Huntington’s disease (HD): Consistent degeneration of the cerebellum and brainstem

Autoren: Rüb U.(1),Hentschel M.(1),Brunt E.(2),Heinsen H.(3),Seidel K.(1),Stratmann K.(1),Paulson H.(4),Vonsattel J.(5),Den Dunnen W.(6),Korf H.(1),

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Abstract:
Background: Huntington’s disease (HD) is a progressive neuropsychiatric disease assigned to the polyglutamine diseases. The brain pathology of HD is characterized by a severe neuronal loss in the striatum and neurodegeneration of select layers of the cerebral neo-and allocortex. The cerebellum and brainstem for a long time were among the brain sites whose neuropathological state in and relevance for the clinical picture of HD were controversial. Objective: To analyse the pathological anatomy of the cerebellum and brainstem in HD patients. Patients and Methods: Serial thick tissue sections through the cerebellum and brainstem of eight clinically diagnosed and genetically confirmed HD patients and twelve control individuals underwent Pigment-Nissl staining for neuronal lipofuscin pigment and Nissl material. Additional cerebellar tissue sections where immunolabeled for the marker of cerebellar Purkinje cells (i.e. calbindin). Results: Our study revealed a consistent neurodegeneration of the cerebellar Purkinje cell layer and cerebellar fastigial, globose, emboliform and dentate nuclei. Additional neuronal loss was present in the following brainstem nuclei: substantia nigra, pontine nuclei, reticulotegmental nucleus of the pons, superior and inferior olives, area of the excitatory burst neurons for horizontal saccades, raphe interpositus and vestibular nuclei. Conclusions: HD is a multisystem degenerative disease associated with a widespread neurodegeneration of the cerebellum and brainstem. Damage to the cerebellum and brainstem contributes to poorly understood HD disease symptoms (i.e. impaired rapid alternating movements, dysarthria, ataxia and postural instability, gait and stance imbalance, broad-based gait and stance, oculomotor dysfunctions).

Kategorie: Poster

Poster 141:

Titel:Inter-observer reliability of thigh muscles and adipose tissue cross-sectional areas

Autoren: Ruhdorfer A.(1),Dannhauer T.(1),Steidle E.(1),Diepold J.(1),Pogacnik A.(1),Wirth W.(1),Eckstein F.(1),

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Abstract:
Introduction: Reduced thigh muscle strength and pro-inflammatory cytokines, secreted from adipose tissue, are proposed to play a role in knee osteoarthritis. MRI permits one to quantify thigh muscles, subcutaneous fat (SCF) and intermuscular fat (IMF) cross-sectional areas (CSAs). Here we evaluate the inter-observer reliability of these measurements. Methods: Three readers without previous experience in image segmentation were involved in the study. After formal training on 3 test datasets, axial thigh MRIs of 10 participants were studied. Segmentation of muscle, SCF, intermuscular tissue (IMT) and IMF CSAs was evaluated at 33% femoral length (distal to proximal). All segmentations were quality controlled (QC) by an experienced reader. Results: There were small systematic differences for the quadriceps CSAs between readers (ANOVA; $p<0.01$), with the maximal difference amounting to 1.9±2.0%. The random variability was 1.5% (RMS CV%), and became lower (1.6±1.9% for the offset, and 1.3% RMS CV%) after QC. No systematic offsets were observed for the other muscle groups, with the RMS CV% for the hamstrings being 7.6/1.1%, and for the adductors 20.0/2.9%, before/after QC, respectively. For SCF and IMT, no systematic offsets were observed; the RMS CV% was 3.4%/2.2% for SCF and 7.4%/6.8% for IMT before/after QC. Deviations for IMF were greater, despite QC. Conclusion: High inter-observer reliability was observed for thigh muscle CSAs. With inexperienced readers, QC is beneficial, particularly to control for appropriate labeling of the hamstrings versus adductors. SCF measurements also were reliable, but a consistent analysis of IMT and IMF is more challenging.

Kategorie: Poster

Poster 142:

Titel:Differential claudin expression in the endolymphatic sac and duct

Autoren: Runggaldier D.(1),Gleiser C.(1),Brockhues J.(1),Wolburg H.(2),Mack A.(3),Hirt B.(1),

Adressen:(1)Department of Clinical Anatomy and Cellular Analysis, Institute of Anatomy|University of Tübingen|Tuebingen|Germany; (2)Department of General Pathology|University of Tübingen, Medical School|Tuebingen|Germany; (3)Department of Cellular Neurobiology, Institute of Anatomy|University of Tübingen|Tuebingen|Germany

Abstract:
The endolymphatic sac (ES) and duct (ED) as part of the inner ear are widely believed to be involved in the regulation of the endolymphatic fluid and ion homeostasis. A dysfunction of these epithelia might therefore be involved in inner ear diseases such as endolymphatic hydrops or Menierâ€™s disease (MD). However, the precise mechanisms and the role of the different parts of the ES and ED in the regulation of the endolymphatic fluid homeostasis still need to be elucidated. To understand the homeostasis of fluids and electrolytes a detailed knowledge about the epithelial barrier that separates the endolymph from the surrounding extracellular fluid space is essential. Hence the aim of our study is to investigate the gene expression pattern of claudins in the ES by TaqMan qPCR analysis and to compare it with the expression pattern of the ED. We found that Claudin 5, 9 and 11 were expressed significantly stronger on the mRNA level in the ED. Other claudins such as Cldn 1, 4, 6, 7, 10, 16 and 17 were either expressed slightly stronger in the ES compared to the ED or â€“ as for Cldn 3, 8, 19, 20, 22, 23 or 24 â€“ expressed at about the same level in both epithelia. Furthermore we are using immunohistochemistry to localize claudin proteins in the endolymphatic epithelia and compare the findings with the ultrastructural characteristics of the tight junctions found in both epithelia by freeze fracture analysis.

Kategorie: Poster

Poster 143:

Titel:The stromal cells with long, slender and moniliform prolongations - a continuous debate

Autoren: Rusu M.(1),

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Abstract:
Telocytes (TCs) were defined in 2010 as a peculiar type of interstitial Cajal-like cell, with long, slender and moniliform cell processes. Soon after they were re-defined as being cells with telopodes. It is discussed that TCs reside virtually in all tissues and occupy the perivascular/periendothelial stem niches. At the same time cordocytes (CCs) were defined as a new cell type, being seemingly similar to TCs. However, the groups dealing with interstitial perivascular cells, TCs, or CCs, failed to observe the perivascular veil cells (VCs) of Majno which were studied since 1965. The VCs, or flat perivascular fibroblasts, of Majno, are morphologically identical both to TCs and CCs. Moreover, the dermal dendrocytes (DCs) are characterized since 1986. Perivascular DCs are identical to VCs. It appears so that the archetype of TCs and CCs are the VCs, at least within periendothelial niches. Moreover, convincing proofs actually support the theory that within the perivascular stem niche not only pericytes, but also VCs/TCs have stem potentialities.

Kategorie: Poster

Poster 144:

Titel:Endocardial tip cells in human embryo - facts and hypotheses

Autoren: Rusu M.(1),Didilescu A.(2),Vrapciu A.(1),

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Abstract:
Recently added information on the coronary embryogenesis is suggestive for the endocardium being an endothelia source for the myocardial networks. Since this has not been previously documented in human embryos, we aimed at studying whether or not endothelial tip cells could be correlated with endocardial-dependent mechanisms of sprouting angiogenesis. Six human embryos (43-56 days) were obtained and processed in accordance with ethical regulations; immunohistochemistry was performed for CD105, CD31, CD34, Î±-smooth muscle actin, desmin and vimentin antibodies. Primitive main vessels were found deriving from both the sinus venosus and aorta, and were sought to be the primordia of the venous and arterial ends of cardiac microcirculation. Subepicardial vessels were found branching into the outer ventricular myocardium, with a pattern of recruiting Î±-SMA+/desmin+ vascular smooth muscle cells and pericytes. Endothelial sprouts were guided by CD31+/CD34+/CD105+ endothelial tip cells. Within the inner myocardium, we found endocardium-derived endothelial networks, guided by filopodia-projecting CD31+/CD34+/CD105+ endocardial tip cells. The myocardial microcirculatory bed in atria was mostly endocardial-derived. Nevertheless, endocardial tip cells were found also at the level of the cardiac cushions, but these were not related to cushion endothelial networks. A general anatomical pattern of cardiac microvascular embryogenesis was thus hypothesized, the arterial and venous ends being linked, respectively, to the aorta and sinus venosus. Further elongation of the vessels may be related to the epicardium and subepicardial stroma and the intramyocardial network, depending on either endothelial and endocardial filopodia-guided tip cells in ventricles, or mostly on endocardium, in atria.

Kategorie: Poster

Poster 145:

Titel:Intrinsic solitary neurons of the human pyriform sinus

Autoren: Rusu M.(1),Selaru M.(2),Vrapciu A.(1),Didilescu A.(3),

Adressen:(1)Anatomy|Faculty of Dental Medicine, "Carol Davila" UMP|Bucharest|Romania; email:anatomon@gmail.com; (2)Anatomy|"Victor Babes" UMP|Timisoara|Romania; (3)Embryology|Faculty of Dental Medicine, "Carol Davila" UMP|Bucharest|Romania

Abstract:
Parasympathetic fibers for the upper pharynx have the origin in the pterygopalatine and/or otic ganglia. The location of the postganglionic parasympathetic neurons of the hypopharynx is less clear at this time. We hypothesized that the hypopharynx wall harbors intrinsic neurons and we aimed to test this hypothesis by conducting an immunohistochemical study on human samples of pyriform sinus. We used antibodies for neuron-specific enolase (NSE), calretinin and S100 protein applied on autopsy samples from four donor cadavers. We identified S100 protein-positive intraepithelial dendritic cells and cell processes, as well as dendritic cells within the lamina propria. Calretinin- and NSE-positive hypopharyngeal solitary neurons were found: (a) building a consistent layer within the lamina propria; (b) perivascular, within the muscle layer. Anatomically, these neurons can act upon the hypopharynx tissues but further studies are mandatory to elucidate and relate their phenotype to an autonomic or sensory pattern.

Kategorie: Poster

Poster 146:

Titel:Uric acid mediated anti-inflammatory effects on microglia

Autoren:Scheffel L.(1),Lucius R.(1),Wilms H.(2),Rickert U.(1),

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Abstract:
Objective: Uric acid (UA) in humans is the end-product of purine metabolism, synthesized by xanthine-dehydrogenase. In previous time elevated UA levels were only connected to gout. New studies suggest an important protective role of UA, by preventing the formation of prion protein Scrapie (PrPsc) in bovine spongiform encephalopathy (BSE) and Creutzfeld-Jakob-Disease (vCJD). Furthermore, its antioxidant effects might attenuate neurodegenerative diseases such as Parkinson's, Alzheimer's and stroke. In this study, the inflammatory response to elevated UA levels on rat microglia in vitro was further investigated. Methods: Avoiding the toxic effects of UA on microglia, cytotoxicity (MTT test) and proliferation tests (crystal violet) were performed with a range of different concentrations. Nitrite oxide (NO) as a pro-inflammatory metabolite was measured photometrically (Griess reagent). The influence of UA on LPS-activated microglia was further analyzed via quantification of mRNA synthesis of iNOS, Cox-2, Il-1 beta, Il-6 and TNF-alpha (qPCR) and additionally of MMPs. Intracellular signaling mechanisms were detected by using Western blotting and immunofluorescence staining. Results: UA below 100 µM isn't cytotoxic for microglia, but supports proliferation. NO-synthesis was downregulated by UA. qPCR analysis showed a significant inhibitory effect of UA of iNOS-, Cox-2-, Il-1-beta, Il-6-, TNF-alpha and MMP 9-mRNA-synthesis on activated microglia. Western blotting data demonstrated an interaction with MAP-kinases. Conclusion: The results indicate that activated microglia decrease pro-inflammatory mediator- and cytokine synthesis in the presence of UA. This effect of UA might be a prognostic benefit in the therapy of neurodegenerative diseases.

Kategorie: Poster

Poster 147:

Titel: SFTA3, a novel protein of the lung: 3D-structure, characterisation and immune activation

Autoren: Schicht M.(1), Rausch F.(1), Finotto S.(2), Mathews M.(2), Mattil A.(2), Schubert M.(2), Koch B.(2), Traxdorf M.(3), Bohr C.(3), Worlitzsch D.(4), Brandt W.(5), Garreis F.(2), Sel S.(6), Paulsen F.(1), Bräuer L.(1)

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Abstract:
The lung constantly interacts with numerous pathogens. Thus, complex local immune defence mechanisms are essential to recognise and dispose of these intruders. This work describes the detection, characterisation and three-dimensional structure of a novel protein of the lung (surfactant-associated protein 3 (SFTA3/SP-H)) with putative immunological features.Bioinformatics, biochemical and immunological methods were combined to elucidate the structure and function of SFTA3. The tissue-specific detection and characterisation was performed by using electron microscopy as well as fluorescence imaging.Three-dimensional structure generation and analysis led to the development of specific antibodies and, as a consequence, to the localisation of a novel protein in human lung under consideration of cystic fibrosis, asthma and sepsis. In vitro experiments revealed that lipopolysaccharide induces expression of SFTA3 in the human lung alveolar type II cell line A549. By contrast, the inflammatory cytokines interleukin (IL)-1β and IL-23 inhibit expression of SFTA3 in A549. Sequence- and structure-based prediction analysis indicated that the novel protein is likely to belong to the family of lung surfactant proteins.The results suggest that SFTA3 is an immunoregulatory protein of the lung with relevant protective functions during inflammation at the mucosal sites.

Kategorie: Poster

Poster 148:

Titel:Camp translocates the desmosomal adhesion molecule desmoglein 2 to cardiomyocyte cell junctions

Autoren: Schinner C.(1),Spindler V.(1),Vielmuth F.(1),Schlipp A.(1),Waschke J.(1),

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Abstract:
The heart muscle is built up of mechanically and functionally coupled cardiomyocytes. Strong intercellular cohesion is crucial for coordinated contraction and conduction and is provided by molecules of the desmosome and adherens junction family. These junctions are often intermingled in areae compositae at the intercalated discs connecting adjacent cardiomyocytes. The desmosomal cadherins desmoglein 2 (Dsg2) and desmocollin 2 together with the classical cadherin N-cadherin (N-cad) are the main members of transmembrane adhesion molecules which are coupled to the cytoskeleton via plaque proteins. Despite its fundamental importance, little is known about the regulation of cardiac cell cohesion. Since our previous studies showed that the second messenger cAMP modulates desmosomal adhesion, we examined the impact of cAMP on the distribution of adhesion molecules in cardiomyocytes. We effectively increased cAMP levels in the HL-1 cardiomyocyte cell line via treatment with a combination of forskolin (stimulation of adenylylcyclase) and rolipram (inhibition of phosphodiesterase IV) (F/R), which was confirmed by ELISA and FRET experiments. We used atomic force microscopy to detect Dsg2 interactions on living cells which were homogenously distributed under control conditions. However, by increasing cAMP levels Dsg2 binding events were enhanced at areas of cell borders and reduced on the cell surface after 60-90 min. Additionally, immunostaining demonstrated increased Dsg2 levels at cell borders following F/R treatment while N-cad localization was not affected. Taken together, cAMP increase caused a rapid translocation of Dsg2 from the cell surface to areas of cell-cell borders.

Kategorie: Poster

Poster 149:

Titel:Localization and activity-dependent regulation of the cisternal organelle in the murine visual system

Autoren: Schlüter A.(1),Gutzmann A.(1),Schultz C.(1),Engelhardt M.(1),
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Abstract:
Synaptopodin (synpo) is an actin-associated protein expressed in the spine apparatus of dendritic spines of cortical and hippocampal neurons. Synpo-deficient mice develop no spine apparatus and show reduced synaptic plasticity, indicating shortcomings in learning and memory. Synpo is also an essential component of the cisternal organelle (CO), a Ca2+-storing compartment located in the axon initial segment (AIS). Our group recently documented an activity-dependent maturation of the AIS in the visual cortex. By comparison, only little is known about the localization, function and putative activity-regulated expression of the CO in the visual system. Here, we investigated the developmental expression of synpo, a specific CO marker, in the murine retina and visual cortex (VC). Additionally, a visual deprivation model was utilized to examine whether morphological maturation of the CO occurs in an activity-dependent manner. In the retina, synpo is initially localized to retinal ganglion cell somata at embryonic stages (E 16.5). It is then redistributed to the nerve fiber layer during postnatal development, precisely to the AIS, where it resides throughout adulthood. In VC, synpo protein expression starts in dendritic spines at P7, and with low numbers of synpo clusters in AIS at P10. Cluster numbers in AIS then increase during the postnatal period past eye-opening at P15 and remain stable during further development. Interestingly, dark rearing for 28 days resulted in significantly increased sizes of synpo clusters in AIS. Taken together, these findings indicate that morphological maturation of the CO is subject to activity-dependent dynamic regulation in the visual system.

Kategorie: Poster

Poster 150:

Titel:Brain region-specific vulnerability of synaptic contacts in shank mutant mice

Autoren: Schmeisser M.(1),Mett C.(1),Halbedl S.(1),Reim D.(1),Reinelt C.(1),Kroegel S.(1),Schaaff M.(1),Cochoy D.(1),Grabrucker S.(2),Grabrucker A.(2),Boeckers T.(1),

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Abstract:
The Shanks are core synaptic scaffold proteins essentially contributing to the morphological and functional integrity of the postsynaptic density (PSD). In recent years malfunction of Shank has been linked to various neuropsychiatric disorders, predominantly autism. We have thus created Shank mutant mice (Schmeisser et al., Nature, 2012) and started to characterize neuroanatomical and neurobehavioral phenotypes. Phenotypical hallmarks are 1) molecular and morphological disruption of glutamatergic synapses varying among brain regions and 2) the robust occurrence of autistic-like behaviours. To unravel spatial and temporal origins of the aforementioned phenotypes, we are currently characterizing several new models of Shank dysfunction and are using various methods to conduct state-of-the-art behavioral analysis combined with a very detailed molecular and morphological evaluation of distinct brain regions. Via this approach, we hope to get a better understanding for the synaptopathic effects underlying Shank mutations in neuropsychiatric disease.

Kategorie: Poster

Poster 151:

Titel:Sudan black b and sudan iii are promising stains for automated proportionator sampling for stereological analysis of alveolar epithelial type ii cells.

Autoren:Schneider J.(1),Pedersen L.(2),Mühlfeld C.(1),Ochs M.(1),

Adressen:(1)Institute of Functional and Applied Anatomy|Hannover Medical School|Hannover|Germany; email:schneider.jan@mh-hannover.de; (2)Department of Stereology|Visiopharm|Hoersholm|Denmark

Abstract:
Design-based stereology allows quantification of structural parameters within an organ, e.g. the number of alveolar epithelial type II cells (AE2) in the lung. If the “density times reference space design” is used, the histologic processing should preserve original tissue dimensions as well as possible so that the reference volume measured before processing is still representative to what is seen on the final section. To quantify AE2 cells properly, it is essential that these can be identified securely on histological sections. Appropriate staining methods for AE2 cells are therefore desirable. Primary fixation of mouse lungs with a mixture of glutaraldehyde and formaldehyde, followed by post fixation of the samples with osmium tetroxide and uranyl acetate, dehydration in acetone and glycol methacrylate embedding preserves the tissue dimensions during dehydration and embedding very well [1]. Due to impairment of antigenicity, this method might interfere with immunohistochemistry. However, lipids (and therefore lamellar bodies of AE2 cells) are well preserved and subsequent lipid staining with Sudan Black B or Sudan III enables a very easy identification of AE2 cells even at low magnifications. The resulting signal is even sufficient for automated detection of AE2 cells by image analysis, which makes this method a promising tool for the proportionator [2], which leads to a faster (and thus more efficient) sampling on histological sections. [1] Schneider JP, Ochs M. Am J Physiol Lung Cell Mol Physiol. 306: L341–L350, 2014. [2] Gardi JE, Nyengaard JR, Gundersen HJG. J Microsc. 230: 108–120, 2008.

Kategorie: Poster

Poster 152:

Titel:Development and correlation of work-related behavior and experience patterns, burnout and quality of life in medical students from their freshmanship to the first Staatsexamen

Autoren: Scholz M.(1),Hammer C.M.(1), Paulsen F.(1), Burger P.H.M.(2)

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Abstract
Symptoms of burnout are common among medical students. Although they usually start with a good health status, their condition deteriorates over the course of their studies. In our study ESTRELLAS we examined 530 medical students in the preclinical semesters (1-4) with validated psychological questionnaires for working habits, burnout symptoms and quality of life.
The longer the students were studying, the more showed risky working habits. In the 4th semester more than 50% revealed risky working habits. Cognitive and emotional burnout symptoms increased coincidentally more than 1.5 times in their intensity, whereas the mental quality of life continuously deteriorated. There was a significant negative correlation between mental quality of life and burnout. Physical parameters showed no alterations.
Medical students´ cognitive and emotional burnout symptoms are constantly increasing from the beginning of their studies. Contemporaneously, the mental quality of life is deteriorating. This might be based on a drastic change towards risky working habits. We suggest to actively work against this process to keep our motivated students and prospective physicians productive and in good mental health. Thus, the medical curriculum should obligatory integrate protective methods for learning how to cope with stress right from the start of medical education.

Kategorie: Poster

Poster 153:

Titel:Morphological characterization of arterial blood supply to the equine menisci

Autoren: Schöpper H.(1),Dürr J.(1),Egerbacher M.(1),

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Abstract:
Basic research in biomechanics and regenerative medicine is often performed in model species. The equine is used to study cartilaginous structures like the meniscus due to its size compared to the human and to the increasing interest in potential therapeutic techniques in veterinary medicine. Comprehensive description of i) arterial blood supply to menisci and ii) intra-menisceal distribution of vessels is needed as a basis for future in vitro and in vivo studies. Regional and age-dependent differences are possible as mechanic properties change in relation to these parameters. To macroscopically evaluate the source of arterial blood supply to the menisci, colored latex and chinese ink was injected in femoral and popliteal of 14 equine stifle joints. Branches of the above mentioned arteries were tracked until entering the menisceal tissue. In addition, menisci were removed for histological and immunohistochemical evaluation (vWF) of vessel distribution within the cartilaginous structure. For potential regional differences cranial, middle and caudal horns were evaluated separately. A multitude of diminutive branches were continuously found, originating from the popliteal and descending genicular artery. Next to the description of branching variations, a vascularization map of the menisci was created. Preliminary evaluation of vWF positive endothelial cells illustrates the microvasculature of menisci and suggests an age-dependent vessel distribution - with decreasing penetration to inner regions with older age. Important basal information on original supply and age-dependent intra-menisceal vascularization pattern could be demonstrated by this work. These findings may promote the equine as a model species for research in human and veterinary medicine.

Kategorie: Poster

Poster 154:

Titel:Differentiation characteristics of a meibocyte epithelial cell line

Autoren: Schröder A.(1),Garreis F.(1),Möbius S.(1),Paulsen F.(1),Hampel U.(1),

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Abstract:
Purpose: Quality and quantity of meibomian gland secretions are crucial for the tear film and ocular surface health. Mature meibocytes are involved in the secretion of meibum. The aim of this study was to characterize the maturation of an immortalized meibomian gland epithelial cell line by different culture media. Methods: Proliferating meibocytes were cultured in keratinocyte serum free medium. Differentiation was induced by Dulbecco's Modified Eagle's Medium containing epithelial growth factor and 10% fetal calf serum (FCS) for 1, 7 or 14 days. Furthermore, differentiation medium was complemented with either 20% FCS, lipid concentrate, 100µM eicosapentaenoic acid (EPA), high glucose or replaced by sebomed medium for 1 or 7 days. Sudan III and Lipid Tox staining were used to illustrate lipid droplets and ultrastructural changes were investigated by transmission electron microscopy (TEM). To analyze cytokeratin (CK) expression Western blot analyses were performed. Results: Lipid staining and TEM analysis of cultivated meibocytes indicated that immortalized meibocytes accumulate lipids, but did not develop to mature meibocytes. Lipid droplet production was induced by differentiation medium after 1 day, but decreased in most cases till day 7. Highest lipid droplet accumulation was observed after EPA and 1 day of 20% FCS supplementation. Real-time RT-PCR and Western blot analysis revealed expression of CK1, -5, -6, -10 and -14 in basal and differentiating meibocytes. Conclusion: Differentiation of the meibomian gland epithelial cell line can be induced by various media supplements, even though mature or hypermature states are not reached.

Kategorie: Poster

Poster 155:

Titel:Galanin receptor detection in the human eye: first results

Autoren: Schroedl F.(1),Kaser-Eichberger A.(2),Trost A.(3),Strohmaier C.(3),Bogner B.(3),Runge C.(3),Krefft K.(3),Bruckner D.(3),Kofler B.(4),Reitsamer H.(3),

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Abstract:
The neuropeptide galanin (GAL) is widely distributed within intrinsic and extrinsic sources supplying the eye. It is involved in regulation of the vascular tone, thus important for ocular homeostasis. Since the distribution of its receptors is unknown, we here screen for the presence of the various gal receptors in the human eye. Meeting the Helsinki-Declaration, human eyes were obtained from the cornea bank and prepared for immunohistochemistry against gal receptors 1 to 3 (GALR1-GALR3). Cell-assays over-expressing GALR1-3 served as specifity- and positive controls, confocal microscopy was used for documentation. In the cornea, GALR1-GALR3 were detected in basal layers of the epithelium, stroma, endothelium, as well as in adjacent conjunctiva. In the iris, GALR1-GALR3 were detected in iris sphincter, dilator and iris vessels. In the ciliary body, GALR1-GALR3 were detected in ciliary muscle, with highest signal for GALR3, and in ciliary body epithelium (GALR1>>GALR3>GALR2), while ciliary body vessels were positive for GALR3 only. In the retina, GALR1 was present in fibers of the IPL/NFL, many cells of the INL and only few cells of the ONL. GALR3 and GALR2 were present in few neurons of the INL, while GALR2 was also found surrounding retinal vessels. In the choroid, GALR1-3 were detectable in nerve fibers surrounding vessels and in intrinsic choroidal neurons. The presence of GALR1-3 in ocular vessels highlights the role of GAL in vessel dynamics, while the presence of GALR in cornea is enigmatic. High GALR3 presence in ciliary body vessels might indicate importance for aqueous humor production. Study-support: PMU-FFF(E-11713/068-SRO)

Kategorie: Poster

Poster 156:

Titel:The brainstem pathologies of parkinson’s disease and dementia with lewy bodies

Autoren: Seidel K.(1),Mahlke J.(1),Siswanto S.(1),Krüger R.(2),Heinsen H.(3),Auburger G.(4),Bouzrou M.(1),Grinberg L.(5),Wicht H.(1),Korf H.(1),den Dunnen W.(6),Rüb U.(1),

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Abstract:
Parkinson’s disease (PD) and dementia with Lewy bodies (DLB) are among the human synucleinopathies, which share the neuropathological features of alpha-synuclein immunoreactive neuronal and/or glial aggregations, coupled with progressive neuronal loss in select brain regions (e.g. substantia nigra, ventral tegmental area). Despite a number of studies about brainstem pathologies in PD and DLB, there is currently no detailed information available regarding the presence of alpha-synuclein immunoreactive inclusions in a) the cranial nerve, precerebellar, vestibular and oculomotor brainstem nuclei and b) brainstem fiber tracts and oligodendroctyes. We performed an analysis of the inclusion pathologies in the brainstems of 6 PD and 5 DLB patients, using an antibody directed at the alpha-synuclein protein on 100 µm thick, PEG embedded sections. As reported previously, LB and LN were most prevalent in well-known predilection sites (e.g. substantia nigra, ventral tegmental area, locus coeruleus, etc). However, we were also able to demonstrate LB and LN in all cranial nerve nuclei, premotor oculomotor, precerebellar and vestibular brainstem nuclei, as well as LN in all brainstem fiber tracts. CB were present in most brainstem nuclei and fiber tracts containing LB and/or LN. These novel findings can contribute to a large variety of less well-explained PD and DLB symptoms (e.g. gait and postural instability, impaired balance and postural reflexes, falls, ingestive and oculomotor dysfunctions), point to the widespread involvement of oligodendroglia in the neuropathological processes and imply disturbances of intra-axonal transport and the transneuronal spread of the underlying pathological processes of PD and DLB along neuroanatomical connections.

Kategorie: Poster

Poster 157:

Titel:Identification of a new aquaporin-4 isoform in the cochlear duct of rat

Autoren: Sigg F.(1),Kalbacher H.(2),Hirt B.(1),Gleiser C.(1),

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Abstract:
The water channel Aquaporin-4 (AQP4) is essential for normal hearing based on the maintenance of water homeostasis during auditory sensory transduction. AQP4 is expressed in the basolateral membrane domains of the epithelial supporting cells in the medial and lateral part of the cochlear duct, but was never detected at the site of transduction, the sensory domain. The AQP4 isoforms in the inner ear belong to six recently described DNA isoforms based on alternative splicing at the N-terminus. In this study, we identified two additional AQP4 cDNA isoforms by 3' RACE-PCR, RT-PCR, and confirmed by sequencing an alternative splicing at the C-terminus of AQP4. We generated an antibody selective for the isoform AQP4-M1 (N-terminal epitope) that also detected AQP4 in the supporting cells of the sensory domain and suggested the expression of a new AQP4 isoform by alternative splicing at the C-terminus. This specific expression pattern of distinct AQP4-isoforms in different supporting cells appears to adjust for subtle local water balance requirements to allow adequate cell volume control during sensory transduction.

Kategorie: Poster

Poster 158:

Titel:Regulation of complement in tenocytes by the complement split fragment c5a and by co-culture with leukocytes

Autoren:Silawal S.(1),Kohl B.(1),Lemke M.(1),Ertel W.(1),Schneider T.(1),Schulze-Tanzil G.(1),

Adressen:(1)Labor für experimentelle Unfallchirurgie|Charité-Universitätsmedizin Berlin, Campus Benjamin Franklin|Berlin|Deutschland

Abstract:
Traumatic and inflammatory events in tissues lead to an interplay of pro- and anti-inflammatory cytokines and the complement system. C5 is a major complement protein which is prone to proteolysis forming the split fragment anaphylatoxin C5a. Complement receptors such as C5aR and complement regulatory proteins (CRPs) are essential for the balance of immunological processes in many tissues and likely also in tendon. The main objective of this study was to understand the impact of C5a and leukocytes on tenocytes complement regulation in vitro. Primary human tenocytes from Hamstring tendons were directly stimulated with recombinant C5a (25 ng/ml, 100 ng/ml) for 0.5 h, 4 h and 24 h in monolayer culture. Additionally, tenocytes and human leukocytes (PBMCs and neutrophils) were combined in an indirect co-culture system (+/- TNF- alpha) for 4 h and 24 h. The gene expression of C5aR, CD46, CD55 and CD59 was monitored using RTD-PCR. Tenocytes stimulated with C5a (25 ng/ml) showed an early increase in CD55, CD59 and C5aR expression followed later (100 ng/ml C5a) by a decreased gene expression of CD59, C5aR, CD46. Tenocytes co-cultured for 4 h with neutrophils and TNF-alpha elevated their C5aR gene expression whereas that of CD59 was suppressed. Tenocyte co-culture with neutrophils (+/- TNF-alpha) lead to a severe reduction of CD55 mRNA after 24 h. Obviously, C5a has a time- and concentration-dependent influence on the gene expression of regulatory complement factors in tenocytes. The interplay between cytokines, anaphylatoxins and leukocytes might influence the outcome in tendon healing.

Kategorie: Poster

Poster 159:

Titel:Assessment of the estrogen receptors expression in ductal carcinomas

Autoren: Sisu A.(1),Folescu R.(1),Stana L.(1),Petrescu C.(1),Motoc A.(1),Zamfir C.(2),Moise M.(1),

Adressen:(1)Department of Anatomy and Embryology|Victor Babes University of Medicine and Pharmacy|Timisoara|Romania; email:alinasisu@gmail.com; (2)Department of Morpho-Functional Sciences|" Gr. T Popa", University of Medicine and Pharmacy|Iassy|Romania

Abstract:
The assessment of the ER (estrogen receptors) expression in the mammary carcinomas as a prognostic and especially predictive factors in the antiestrogenic endocrine adjuvant therapy represents the element of the traceability protocol in mammary neoplasm. We have studied the ER for 96 invasive ductal carcinomas. Ductal carcinomas in situ were positive for the ER in a percentage of 60% (three cases), one cribriform DCIS high positive (ER3+) and two solid DCIS – one of them weak positive (ER1+) and the other high positive (ER3+). DCIS with apocrine differentiation and one of the solid DCIS were negative. Out of the 96 invasive ductal carcinomas, a number of 28 (29%) cases were positive estrogen receptor, the rest being negative. Regarding the expression level of the ER expression, 2 carcinomas was weak positive (ER1+), 14 cases were moderate positive (ER2+) and 12 carcinomas were intense positive (ER3+). Out of the estrogen positive invasive carcinoma cases, the ductal invasive type presented the most cases with intense positive ER (ER3+). In situ ductal carcinomas were most frequently associated with invasive ductal carcinoma. We have observed that the values and the distribution of the ER taken from the biopsies made in the patients with mammary carcinoma are influenced by the age and menopausal status. Keywords: estrogen receptors, ductal carcinoma, in situ carcinoma.

Kategorie: Poster

Poster 160:

Titel:Pituitary gland and parasellar area- clinical anatomy

Autoren: Sisu A.(1),Motoc A.(1),Folescu R.(1),Ilie C.(1),Petrescu C.(1),Zamfir C.(2),Moise M.(1),

Adressen:(1)Department of Anatomy and Embryology|Victor Babes University of Medicine and Pharmacy|Timisoara|Romania; email:alinasisu@gmail.com; (2)Department of Morpho-Functional Sciences|" Gr. T Popa", University of Medicine and Pharmacy|Iassy|Romania

Abstract:
MR is the imaging method of choice for MRI imaging of the pituitary gland and the parasellar area. Typical MR imaging protocol of the pituitary gland and sellar region including should consist of unenhanced T1- weighted and T2-weighted images in coronal and sagittal plane. In all cases (18, both gender and average age of 45.7), the posterior lobe of the pituitary demonstrates high signal intensity on T1- and T2-weighted images, in front of the dorsum sellae. This high intensity signal observed in the posterior lobe is believed to be related to intracellular lipid or lipid-like material in astrocytic glial cells Absence of this high intensity signal have been reported in patients with central diabetes insipidus. The upper surface is flat or slightly concave and the height of the pituitary gland in the sagittal plane is about 2-6mm, with no differences between girls and boys. Physiologic hypertrophy of the pituitary can be observed during pregnancy, when the gland may increase in weight by 30%-100%. Until the age of 50 years, progressive involution of the gland is noticed, probably related to the decrease in normal pituitary activity during menopause and andropause period. In about 30% of this population the high signal intensity of the posterior pituitary lobe is not usually visible, as well as in the empty sella syndrome, but those specific changes are usual signs of normal aging process. Keywords: MRI imaging, pituitary gland, sella turcica

Kategorie: Poster

Poster 161:

Titel:Hypoxia-induced activation of the inflammasome and regulation by gonadal steroid hormones in glia cells

Autoren: Slowik A.(1),Lammerding L.(1),Zendehdel A.(1),Beyer C.(1),

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Abstract:
The mobilization of the multi-protein complex termed inflammasome which leads to the activation of caspase 1 and IL-1beta production plays a decisive role in the chronological course of stroke pathophysiology. In a transient focal ischemia rat model, we could demonstrate a sequential stimulation of different inflammasome components over a time period of 3 h to 3 d. This prompted us to pursue which cell types respond to hypoxia by inflammasome activation and whether there exists a cell-type specific inflammasome response. Using an in vitro hypoxia chamber and primary mouse cell cultures of glia cells and the murine microglia-like cell line BV-2, we studied the influence of short-term hypoxia on the inflammasome activity. Since gonadal steroids are neuroprotective in the above in vivo stroke model, we also studied the influence of 17beta-estradiol (E2) and progesterone (P) on these parameters. Short-term in vitro hypoxia for 3 h caused an up-regulation of the inflammasomes NLRP3 in astrocytes and BV-2 cells and of NLRP1b only in BV2. After oxygen reperfusion, expression returned to normal values. The application of sex hormones decreased the expression of Hif1a and COX-2 in astrocytes and of NLRP1b and IL-1b in BV-2 cells under hypoxic conditions. Our data suggest that microglia and astroglial sense hypoxic conditions and respond individually by the activation of different inflammatory genes and inflammasome components. Sex steroids appear to dampen the inflammatory potential of both cell types.

Kategorie: Poster

Poster 162:

Titel:Terminally differentiated epithelial cells of the thymic medulla and skin express nicotinic acetylcholine receptor subunit alpha3

Autoren: Soultanova A.(1),Panneck A.(1),Rafiq A.(1),Kummer W.(1),

Adressen:(1)Institute for Anatomy and Cell Biology|Justus Liebig University Giessen|Giessen|Germany

Abstract:
In the thymus, T cell maturation is influenced by cholinergic signaling, and the predominantly expressed receptor is the alpha3-subunit of nicotinic acetylcholine receptors, encoded by the chrna3 gene. We here determined its cellular distribution utilizing an appropriate eGFP-expressing reporter mouse strain. Neither T cells (CD4, CD8) nor mesenchymal cells (desmin-positive) expressed eGFP. In the thymic medulla, eGFP-positive cells were either scattered or, more frequently, formed small clusters resembling Hassall's corpuscles. Immunolabeling revealed that these cells were indeed terminally differentiated epithelial cells expressing keratin 10 (K10) but neither typical cortical (K8, K18) nor medullary keratins (K5, K14). These labeling patterns reflected those in the epidermis of the skin, where overlap of K10- and eGFP-expression was seen in the stratum granulosum, whereas underlying basal cells displayed K5-immunoreactivity. A substantial portion of thymic eGFP-positive cells was also immunoreactive to chromogranin A, a peptide previously reported in epidermal keratinocytes in the stratum granulosum. Its fragment catestatin has multiple biological activities, including suppression of proinflammatory cytokine release from macrophages and inhibition of alpha3/beta4 nAChR. The present findings suggest that its thymic production and/or release are under cholinergic control involving nAChR containing the alpha3-subunit.

Kategorie: Poster

Poster 163:

Titel:Reduced dsg2 adhesion is involved in intestinal epithelial barrier loss in Crohn’s disease

Autoren: Spindler V.(1),Vigh B.(1),Meir M.(2),Hütz K.(1),Flemming S.(2),Schlegel N.(2),Waschke J.(1),

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Abstract:
The barrier function established by intestinal epithelial cells is essential for gut homeostasis and is compromised in patients with Crohn’s disease. This function is dependent on junctional complexes comprising of a set of intercellular junctions, namely tight junctions, adherens junctions, and desmosomes. Previously, we have shown that intercellular adhesion mediated by the desmosomal adhesion molecule desmoglein2 (Dsg2) is required for the integrity of tight junctions. Here, we demonstrate that Dsg2 levels are dramatically reduced in biopsies of patients with Crohn’s disease. Furthermore, TNFalpha, a central cytokine in Crohn’s disease, led to loss of cell cohesion and increased permeability in Caco-2 and HCT116 cells. This was paralleled by loss of Dsg2 immunostaining at cell borders with concomitant reduction of the tight junction protein claudin1. These effects were mediated at least in part by increased activity of p38MAPK, since inhibition of this kinase restored intercellular adhesion and blunted the permeability increase induced by TNFalpha. Importantly, stabilizing desmosomal adhesion via a Dsg-specific peptide ameliorated loss of barrier functions. Furthermore, TNFalpha treatment, p38MAPK activation and silencing of Dsg2 reduced the amount of the second messenger cAMP. In line with this, elevation of cAMP levels increased the levels of the tight junction molecule claudin1 in HCT116 cells. Thus, our data indicate an important role of p38MAPK-mediated regulation of desmosomal adhesion for epithelial permeability and suggest a contribution of impaired Dsg2 adhesion and cAMP levels to the pathogenesis of Crohn’s disease.

Kategorie: Poster

Poster 164:

Titel:Volumetric analysis of the infra-patellar fat pat (ipfp) – reliability and preliminary findings in subjects with unilateral knee pain

Autoren: Steidle E.(1),Ruhdorfer A.(1),Diepold J.(1),Wirth W.(1),Dannhauer T.(1),Eckstein F.(1),

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Abstract:
OBJECTIVE: The infra-patellar fat pad (IPFP) of “Hoffa” is an accumulation of intra-articular adipose tissue and animal experimentation has shown that it plays a role in knee osteoarthritis, by releasing Leptin and pro-inflammatory cytokines. Here we explore whether MRI measurements of the IPFP in humans are reliable and sensitive to pain. METHODS: We used MRIs from participants from the Osteoarthritis Initiative (OAI) to evaluate a) differences between fat-suppressed and non-fat-suppressed imaging, b) inter-observer variability (3 readers) and c) side differences in participants with unilateral knee pain. RESULTS: IPFP volumes of 10 healthy reference subjects were smaller (approx. 10%) in fat-suppressed than non-fat-suppressed images, but measurements from both sequences were highly correlated ($r>0.990$ between readers). There were slight systematic differences between the 3 observers (ANOVA; $p=0.0034$) with the maximal difference amounting to 0.5%. The inter-observer reliability was 2.0% (RMS CV%) for IPFP volume with fat-suppressed and 1.3% with non-fat-suppressed imaging. There was no significant difference in the IPFP volume between painful and non-painful contralateral knees. There were also no significant differences in the IPFP MRI signal, suggesting higher mean values / SDs /CV% (signal heterogeneity) in painful limbs. CONCLUSION: Despite small systematic differences, there was a high linear relationship between fat-suppressed and non-fat-suppressed images, and the inter-observer reliability was reasonable for both imaging protocols. Agreement was improved with expert QC (data not shown). The preliminary data on the effect of unilateral pain did not indicate a systematic difference in quantitative IPFP parameters.

Kategorie: Poster

Poster 165:

Titel:The "roof configuration" of the distal radius

Autoren:Stelzhammer D.(1),Brenner E.(1),

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Abstract:
The "roof configuration"• of the distal radius David Stelzhammer, Erich Brenner Background: Distal radial fractures are the most frequent fractures of the human musculoskeletal system, especially in children - so-called greenstick fractures - and old people who are often suffering from osteoporotic fractures. In recent literature, countless publications dealt with problems focusing on volar plating. The majority of these studies pointed out injuries of neighbouring neurovascular and musculotendinous structures such as the radial artery and the flexor carpi radialis muscle. Publications concerning optimization in the placement of volar plates and screws used for fracture treatment and consequently less injuries caused by the plates and screws, are still scarce. Aim: We wanted to investigate specific osteological features, especially the distal roof configuration and the distal radioulnar joint, to give insight into the shape of the distal radius to optimize fracture care and surgical intervention by minimizing the risk of iatrogenic tendon ruptures or pseudarthrosis. Material and Methods: We investigated 418 human radius. The distal configuration of 265 macerated bones from our Division and HR-CT DICOM data sets of 153 distal radius from the Ludwig-Maximilians-University of Munich were analysed separately. Results: There was no significant coherence between the observed sides of our distal roof configuration in both groups. According to the literature we also observed four different types of distal radioulnar joint configurations. Conclusion: Whereas there is no uniform recommendation for preventing iatrogenic injuries, the number of different screws available at a surgical department might be reduced and economic advantages can be achieved.

Kategorie: Poster

Poster 166:

Titel:Immunolocalization of antimicrobial and cytoskeletal components in the serous glands of human sinonasal mucosa

Autoren: Stoeckelhuber M.(1),Olzowy B.(2),Ihler F.(3),Christoph M.(3),Scherer E.(4),Babaryka G.(5),Loeffelbein D.(1),Rohleder N.(1),Nieberler M.(1),Kesting M.(1),

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Abstract:
Secretory cells in the seromucous glands of paranasal sinuses secrete antibacterial proteins for innate immune mucosal integrity. We studied the localization of antimicrobial and cytoskeletal components of the human seromucous glands and respiratory epithelium of the maxillary sinus and the ethmoidal cells by immunohistochemical methods. The presence of a variety of defense proteins such as lysozyme, lactoferrin, cathelicidin, and defensin-1, -2, -3 point to a crucial role in the immune defense for the respiratory tract. Cytoskeletal proteins such as actin, myosin 2, cytokeratin 7 and 19, alpha- and beta-tubulin, investigated for the first time in glands of paranasal sinuses, showed a stronger expression at the apical and lateral cell membrane. The localization of the cytoskeletal proteins might point to their participation in exocrine secretory processes and stabilizing effects.

Kategorie: Poster

Poster 167:

Titel:Applications of e-testing in anatomical teaching

Autoren: Streicher J.(1),Gruber G.(1),Weiss C.(2),Grill C.(1),Brugger P.(1),Blumer R.(1),Weninger W.(1),

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Abstract:
In modern curricula the time frame for anatomy teaching has been reduced, but the successful integration with clinical applications must be confirmed. Taking into account the high number of students at the Medical University of Vienna, and the parallel education of second- and third-year students, over 4000 individual assessments have to be plannend, held and evaluated each term. Therefore a range of e-testing applications were implemented. In settings where students have no access to PCs (e.g. at the dissection halls), auditory response systems are employed, whereas assessments held in a PC-room use the moodle Course Management System. In both cases most of the questions are image-based mc-questions. Due to the information about their grades immediately after the assessment, the equal level of difficulty for all students, and the chance to instantly clear up misunderstandings, the studentsâ€™ compliance was encouraging during the past five years. Both types e-testing are technically mature and cost- and time-saving. Immediate statistical analyses of answer patterns provide teachers with valuable, objective feedback and enable them to instantly adapt contents and objectives to the students actual level of competence.

Kategorie: Poster

Poster 168:

Titel:Heterogeneities in the dendritic scaling of the cerebellar nuclei of rodents and primates: a new mechanism underlying brain folding?

Autoren: Sultan F.(1),Hamodeh S.(1),

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Abstract:
The dentate nucleus undergoes marked changes in its shape during the evolution of primates, leading to the "toothed" shaped form in apes and humans. In this study, we looked at the relationship of the folding of the dentate to the scaling of the dendrites in the cerebellar nuclei. Scaling of neurons has been proposed to conform to allometric laws determining the length of neuronal processes. We compared the dendritic length of the cerebellar nuclei of rats and monkeys. We find that the dendritic length density is remarkably constant within the two species and because the neuron density decreases, the dendritic length per neuron increases and would conform to allometric scaling. Our analysis, however, also uncovers an important deviation from this allometric scaling within the dentate nucleus of the monkey. Here we observe a reduction in the dendritic length per neuron. A comparison to Golgi-stained neurons (Chan-Palay, 1977) shows that this is due to a smaller than expected dendritic field that neurons have in the dentate nucleus of the monkey. These smaller dendritic fields could underlie the folding that is observed in this nucleus in primates. In summary, our findings show regular scaling of dendrites in the cerebellar nuclei and also point to deviations thereof in the phylogenetically newer nucleus that likely has important consequences in determining primate brain functions.

Kategorie: Poster

Poster 169:

Titel:Polar arteries of the spleen and their surgical importance

Autoren: Surdu L.(1),Bordei P.(1),Iliescu D.(1),

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Abstract:
Our study assesses the presence, origin and appearance of polar arteries of the spleen. The study was performed on 128 cases for the cranial polar artery and 102 cases for the caudal polar artery, using as study method the dissection, the plastic injection (Technovit 7143), followed by corrosion and the study of simple and CT angiographies. We found the cranial polar artery of the spleen in 92 cases (71.88% of the cases). Most frequently it originates from the upper primary terminal branch of the splenic artery in 65 cases, followed by origin from the splenic artery trunk in 22 cases, from the lower primary terminal branch in 4 cases and from the superior mesenteric artery in 1 case. The caudal polar artery was found in 82 cases (80.39% of the cases). The caudal polar artery had its origin from the lower primary terminal branch of the splenic artery in 61 cases, from the splenic artery trunk in 19 cases and from the gastroomental artery in 9 cases. Frequently, when the lower polar artery originates from the gastroomental artery, it doubles the one that originates from the splenic artery trunk or from its lower terminal branch. We found differences from the literature because we considered as polar branches, the arteries that supply spleen poles and originate extraparenchymatous. The spleen poles are areas that may be subject to segmental resection. Polar arteries can be source of major hemorrhage. They are thin branches which can be easily injured during splenectomy.

Kategorie: Poster

Poster 170:

Titel:A subset of neuroendocrine cells of the prostate derives from the neural crest

Autoren: Szczyrba J.(1),Niesen A.(1),Wagner M.(2),Wandernoth P.(1),Aumüller G.(3),Wennemuth G.(1),

Adressen:(1)Department of Anatomy|University Duisburg-Essen|Essen|Germany; email:jaroslaw.szczyrba@uk-essen.de; (2)Institute of Pathology|Saarland University|Homburg|Germany; (3)Department of Anatomy and Cell Biology|Philipps University of Marburg|Marburg|Germany

Abstract:
Prostate carcinoma is still the most common diagnosed cancer type in males worldwide. This carcinoma is mainly growing slowly and features a late metastatic potential. It also includes aggressive forms with androgen-independent growth, like pure neuroendocrine tumors (small-cell carcinoma) or tumors with an extensive neuroendocrine differentiation (carcinoid/carcinoid-like tumors). Neuroendocrine cells have several functions like the induction of epithelial cell growth and differentiation in an androgen-independent manner via production of mitogens and other cell-stimulating substances. The histogenesis of this cell population, however, is not clear yet. The discussed origins of NE cells are an endodermal origin from pluripotent prostatic stem cells and migrating neural crest cells as a source of prostatic NE cells. To investigate the origin of neuroendocrine cells in the human prostate, immunohistochemical chromogranin A staining of human fetal prostates of 18 and 25 gestation weeks and a subsequent 3D reconstruction were performed. We discovered differences in the distribution of NE cells between the different developing stages at which NE cell localization progressively switched from prostatic stroma and extraprostatic paraganglia to glandular and urethral epithelia. Additionally, we show in a knock-in mouse model that a subset of prostatic NE cells co-express the murine NE marker serotonin as well as YFP under control of a WNT1 promoter induced during neurogenesis in neural crest cells. This work confirms the model of progenitor NE cell migration from the neural crest to the glandular epithelium of the prostate via paraganglia and helps to solve the question of the prostatic NE cell origin.

Kategorie: Poster

Poster 171:

Titel:The effect of excessive number of lumbar vertebra to static and dynamic of vertebral column

Autoren:Tasdemir R.(1),Aksu E.(1),Sertel S.(2),Yener D.(1),Colak T.(1),Bamac B.(1),

Adressen:(1)Anatomy|Kocaeli University|Umuttepe|Turkey; email:rabia.tasdemir@kocaeli.edu.tr; (2)Physcal Teraphy and Rehabilitation|Abant Ýzzet Baysal University|Gölköy|Turkey

Abstract:
Vertebral column is a dynamic column which carries the weight of the body and transfers this weight to the pelvis skeleton. Vertebral column is composed of 33-34 vertebra. (7 cervical,12 thoracic,5 lumbar, 5 sacral and 4-5 coccygeal).Vertebra numbers also affect discus intervertebralis and the number of spinal nerves coming out of foramen intervertebralis. In our study, we detected 6 lumbar vertebras in a radiologic evaluation of a 19 year old female patient who has low back pain, lordosis, anterior cervical tilt, flatfoot and hyperextension of knee. Patient's antropometric measurements (age:19, weight:85, height:165 cm, BMI:31.2, waist circumference:93 cm, abdomen circumference:98.7 cm, thigh circumference:129.8 cm) have been noted. The patient's muscle shortness test has been done and moderate degree of shortening has been detected in the quadriceps femoris muscle and pectoral region muscles. In addition, muscle strength test has been done and weakness has been found in the abdominal muscles and gluteus maximus muscle. We have determined that these performed physical measurements have been affected by the number of lumbar vertebra. In addition, we think that the patient's flatfoot, lordosis, anterior cervical tilt and hyperextension of knee have occurred due to the number of lumbar vertebra with a chain reaction in time. As a result, to those patients who have excessive number of vertebra detected in the early period, exercise and orthotics supplement need to be done to prevent disease like flatfoot, lordosis, scoliosis, genu varum, genu valgum in the advanced period.

Kategorie: Poster

Poster 172:

Titel:Fascia structures of the neck

Autoren: Tillmann B.(1),Paulsen F.(2),

Adressen:(1)Department of Anatomy|Christian Albrecht University Kiel|Kiel|Germany; email:bntill@t-online.de; (2)Department of Anatomy II|Friedrich Alexander University Erlangen-Nürnberg|Erlangen|Germany

Abstract:
With regard to the descriptions of the fascial structures of the neck the international clinical and anatomical publications are inconsistent, confusing and partly incorrect. The Nomina Anatomica are not helpful to solve this problem. We therefore re-evaluated the system of cervical fascia including the carotid sheet and the fascia of the neck organs by means of macroscopic dissection, gelatin injection, macroscopic serial sections, whole mount histological sections and three-dimensional reconstruction. We found that the superficial sheet (Lamina superficialis) of the cervical fascia differs in the various regions. In the lateral cervical region it does not have a typical fascia structure but consists of loose, high-fat connective tissue (so-called Lamina cribosa). It surrounds the sternocleidomastoid and trapezius muscles. The term Lamina pretrachealis for the middle sheet taken from the Nomina Anatomica is incorrect, as the fascia only surrounds the infrahoyid muscles. This also applies to the term Lamina prevertebralis, as not only the prevertebral muscles are surrounded but also autochtonous muscles and the levator scapulae muscle. The so-called alar sheets expand between the prevertebral fascia and the common organ fascia. The carotid sheet forms a column between the cervical fascia. Its three branches are connected to the three sheets of the cervical fascia. The fascia structures of the neck also include the so-called organ fasciae. The fascia surrounding all neck organs is called common organ fascia. In addition, each single organ is covered by specific organ fascia (fibrous capsules, adventitia) The results are discussed with regard to their clinical relevance. Moreover, suggestions for a adapted nomenclature are given.

Kategorie: Poster

Poster 173:

Titel:August Rauber – the founder of functional anatomy - revisision history of medicine

Autoren: Tillmann B.(1),Rühlmann F.(2),

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Abstract:
Wilhelm Roux and Julius Wolff are both regarded as the founders of the functional anatomy of osseous tissues. However, this opinion must be revised since in 1867 August Rauber already published aspects of physical laws in the functional anatomy of osseous tissue in his monography “Elasticität und Festigkeit der Knochen. Anatomisch – Physiologische Studie”. These findings were only reproduced by Roux and Wolff and, yet, presented as own new findings. The aim of this presentation is to draw attention to the fundamental findings of Rauber and thereby to revise the history of medicine in respect of the founder of functional anatomy of osseous tissue. Rauber should be recognized as the first scientist reporting on the economic structure of osseous tissue, the trajectorial architecture of the trabecular bone, and the functional adaption of the cross section shape of long bones in response to local mechanical stress. In the essence, Rauber basically described the physical laws of the “Maximum – Minimum – Law” which later on only was attributed to Roux. In addition, Rauber first stated that the whole bone is a body of uniform strength. The findings of August Rauber are neither discussed nor cited in the literature.

Kategorie: Poster

Poster 174:

Titel:Laparoscopic approach to the pudendal nerve based on an anatomic study

Autoren: Trubel S.(1), Zimmermann R.(1),Foditsch E.(1),Konschake M.(2), Hörmann R.(2), Künzel K.(2),Janetschek G.(1),

Adressen:(1)Department of Urology|Spinal Cord Injury and Tissue Regeneration Centre Salzburg, Paracelsus Medical University|Salzburg|Austria; email:guenter.janetschek@salk.at; (2)Department of Anatomy, Histology and Embryology|Division of Clinical and Functional Anatomy|Innsbruck|Austria

Abstract:
Aim: Recently it has been shown that neuromodulation of the pudendal nerve (PN) is an alternative to stimulation of S3. However, this nerve is difficult to approach from the outside. Therefore, based on our anatomic study, we have developed a laparoscopic approach allowing for reproducible, precise, and minimally invasive identification of the PN. Methods: The main landmarks identified by the precedent anatomic study are the internal pudendal artery (IPA), the coccygeal muscle (CM), the spine, and the sacrospinous ligament (SSL). The laparoscopic approach is demonstrated step by step. Results: The IPA is identified and followed down to the pelvic floor where it disappears behind the CM. This muscle is incised alongside the PA to identify the SSL. The SSL is hidden behind the fibers of the CM which have to be cleared away. Identification of the SSL is facilitated by palpation of the spine. The IPA leaves the pelvis at the underside of the SSL, which is followed medially. The PN is the most medial structure running in the groove formed by the SSL ventromedial and the sacrotuberous ligament dorsomedial. The PN is the most medial nerve of the sacral plexus (S2-S4). It leaves the pelvis through the infrapiriform foramen. Because of this typical anatomic configuration the PN cannot be confounded with any other nerve at this location. Conclusion: The knowledge of the topographic anatomy gained by our anatomic study now allows for precise and reliable identification of the PN by means of laparoscopy.

Kategorie: Poster

Poster 175:

Titel:Structure of the wall of the healthy great saphenous vein

Autoren: Tsantilas P.(1),Brenner E.(2),

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Abstract:
Aims: The aim was the histological examination of the wall of the healthy great saphenous vein (GSV) in relation to its valves. Methods: Ten GSVs of ten unembalmed cadavers, without an evidence of varices, were investigated. Three transverse and four longitudinal series were stained with hematoxylin and eosin, Masson's trichrome, Weigert's elastic, and immunohistochemistry. Results: The wall of a healthy GSV consists of the tunicae intima, media, and externa. The intima-media limit corresponds to the internal elastic lamina (IEL), whereas the media-externa limit is formed by the outermost circular muscle layer. The intima varies in thickness and consists of an endothelium, thin elastic fibres (EF), collagen fibres (CF), single smooth muscle cells (SMC), and the IEL. The media consists of an inner media longitudinalis, and an outer media circularis. Between those SMC bundles and layers, we found CF and semi-dense, longitudinal EF. The externa consists of dense CF, longitudinal, dense EF, and longitudinal SMC bundles. At the valve, the IEL runs along the luminal part of the wall, the agger and the cusps. The sinusal wall contains a thinner IEL with no connection to the prior. Single alpha-SMA positive cells were seen within the cusps. SMC bundles were found in the Agger, representing a thickened media longitudinalis. At the agger, the SMC-layers within the media circularis become disorganized. Conclusions: The wall of a healthy GSV has a uniform structure. There are delicate distinctions in the wall at the site of venous valves in comparison to the rest of the wall.

Kategorie: Poster

Poster 176:

Titel:Axis specification and developmental timing in the evolution of early vertebrate development

Autoren:Tsikolia N.(1),Stankova(1),Schröder(1),Hue(2),Viebahn(1),

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Abstract:
Gastrulation in birds and mammals is marked by the primitive streak as an evolutionary novel site of epitheliomesenchymal transition and results in the development of germ layers and notochord. As the primitive streak forms in amniotes with divergent topographies it may have emerged twice and independently from the ancestral blastopore and may be considered an evolutionary constraint. In addition, extensive lateral to medial tissue rearrangement prior to gastrulation observed recently in the rabbit may represent a heterochrony similar to the one discussed for the chick. Intriguingly, experimental inhibition of these cell movements in the rabbit blastocyst in vitro produced novel gastrulation forms resembling evolutionary transformation steps from the circular blastopore to the straight primitive streak. Another case with a temporal shift in cellular mechanisms causing developmental divergence may be left-right symmetry breaking, which varies preceding the standard left-sided expression of nodal in the early lateral plate mesoderm: breaking symmetry is associated with ciliary flow near early transient axial organs in mouse, Xenopus, and zebrafish, but not in chick and pig embryos, which lack cilia in the appropriate location (i.e. near the node). In addition, in chick, pig and cattle embryos the asymmetrical paramedian nodal domain appears ‘precociously’ during the early phase of notochord formation, whereas in mouse, rabbit and Xenopus it starts symmetrically and becomes asymmetrical later, during somite formation. The novel sequence of evolutionary modifications in gastrulation topography and the divergent emergence of molecular left-right asymmetry reveal an unsuspected relationship between timing and developmental constraints in vertebrate development.

Kategorie: Poster

Poster 177:

Titel:Catecholaminergic neurons in the mouse and rat esophagus

Autoren: van der Keylen P.(1),Garreis F.(1),Neuhuber W.(1),Wörl J.(1),

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Abstract:
The rodent esophagus is innervated by extrinsic vagal and sympathetic efferent, vagal and spinal afferent and enteric neurons. While vagal efferent and afferent, spinal afferent and enteric neurons provide cholinergic, glutamatergic, peptidergic and nitrergic, respectively, components, sympathetic postganglionic neurons were heretofore regarded as the sole source of catecholaminergic innervation. However, the presence of enteric dopaminergic neurons in the small intestine (Li et al., J Neurosci 2004, 24:1330) prompted us to look for catecholaminergic enteric neurons in the esophagus. Methods: Mouse and rat esophagi were investigated using immunohistochemistry and quantitative RT-PCR for tyrosine hydroxylase and dopamine beta hydroxylase. Results: Both qRT-PCR and immunohistochemistry provided evidence for a significant catecholaminergic enteric neuronal subpopulation in mouse and rat esophagus. These neurons typically displayed a TH/DBH phenotype, although neurons staining for only one marker were frequently observed. Even motor endplates of striated muscle fibers in the tunica muscularis were frequently contacted by TH/DBH positive varicose axons. Conclusion: Enteric neurons with a catecholaminergic phenotype are present in the rodent esophagus. There is also evidence for a catecholaminergic co-innervation of striated esophageal muscle which most likely derived from enteric neurons, in addition to the well-known nitrergic/peptidergic enteric co-innervation.

Kategorie: Poster

Poster 178:

Titel:Denervation-induced dendritic atrophy of dentate granule cells can be prevented by sphingosine-1-phosphate receptor antagonists

Autoren:Vlachos A.(1),Willems L.(1),Becker D.(1),Zahn N.(1),Scholich K.(2),Deller T.(1),

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Abstract:
Denervation-induced remodeling of neuronal dendrites occurs in the context of many neurological diseases. The temporal dynamics and the molecular regulation of these cellular changes are incompletely understood. Here, we used the entorhinal denervation in vitro model to assess the role of Sphingosine-1-phosphate (S1P), a candidate signaling molecule. Time-lapse microscopy of GFP-positive granule cells in organotypic entorhino-hippocampal slice cultures prepared from Thy1-GFP mice was employed to follow dendritic changes for a period of up to 6 weeks after deafferentation. A set of slice cultures was treated with FTY720 (Fingolimod) or the S1P receptor antagonist VPC23019. In untreated cultures profound changes in dendritic dynamics were observed following entorhinal deafferentation: dendritic elongation and retraction events were markedly increased, resulting in a net reduction of total dendritic length (TDL) during the first two weeks after denervation, followed by a gradual recovery in TDL. FTY720- and VPC23019-treatment prevented the denervation-induced net retraction of dendrites, while having no apparent effect on dendritic dynamics in non-denervated control cultures. We conclude that inhibition of S1P receptor signaling promotes dendritic stability in deafferented neuronal networks and prevents the loss of dendrites. These results suggest that neural S1P receptor modulation could be a promising new target in the treatment of neurological diseases (supported by LOEWE-program Lipid Signaling Forschungszentrum Frankfurt and DFG).

Kategorie: Poster

Poster 179:

Titel:Exploring the intrinsic regeneration-capacity of the cns neurons after spinal cord injury

Autoren: Vogelaar C.(1),Müller K.(1),Kunz A.(1),Nitsch R.(1),

Adressen:(1)University Medical Center Johannes Gutenberg-University Mainz|Institute of Microanatomy and Neurobiology|Mainz|Germany; email:tineke.vogelaar@unimedizin-mainz.de

Abstract:
Unlike axons in the peripheral nervous system (PNS), axons in the central nervous system (CNS) are hardly able to regenerate. This is partly due to extrinsic factors, like lesion-induced scarring and accumulation of axon growth-inhibitory molecules. A great part, however, of CNS regeneration failure is caused by intrinsic factors, like neuronal atrophy, the lack of new growth cone formation and the inability to activate a regeneration-associated gene expression program. Our recent work, however, suggests that local treatment in the injured spinal cord with an iron chelator and cAMP can influence gene expression in the motor cortex starting as early as 1 day after application. The treatment led to alterations into the direction of cell survival, axon growth and repair (Kruse et al, 2011). These data indicate that the neurons received an early signal from the treated injured axons, increasing their intrinsic regeneration-ability. We are currently using the treatment as a tool to identify regeneration-associated signalling molecules in the motor cortex. Another new intrinsic aspect of axon regeneration is the localization of ribosomes and mRNA in the axon itself. This was shown for PNS axons of all developmental stages, including adult axons. Local treatment of the axons in a compartmented culture model with □-actin siRNA reduced the formation of a new growth cone in vitro (Vogelaar et al, 2009). We now created rAAV1/2 viruses that transduce eGFP-tagged ribosomal protein L4 and transgenic mice expressing floxed-stop-L4-TdTomato, which we will use to investigate ribosome transport in PNS and CNS axons in vivo.

Kategorie: Poster

Poster 180:

Titel:Evidence for a complex defect of corticogenesis in psen1 – deficient mice

Autoren:von Beckerath V.(1),Hartmann D.(1),Rau(1),Zoons(1),De Strooper(2),

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Abstract:
We have previously reported that PSEN1 deficiency in mice causes a cortical malformation similar to type II lissencephaly. We could then demonstrate a loss of Cajal-Retzius neurons from the marginal zone, causing a reduction of both reelin and chondroitin sulfates, i.e. key factors responsible for the termination of cortical neuron movement. More recent data demonstrating pioneer neuron development from the cortical hem and identifying the lateral ganglionic eminence as a key source for cortical interneurons have stimulated us to re-investigate this fascinating phenotype. Our data indicate that already the tangential immigration of Cajal-Retzius cells is altered in PSEN1 deficient mice, with more irregularly spaced cell situated farther away from the meningeal surface than in WT mice, together pointing towards a defective interaction with the brain surface. Surprisingly, we could demonstrate high levels of APP expression in these cells, creating a tentative link to the phenotypically related, but genetically less penetrant occurrence of cobblestone lissencephaly in APP/APLP triple deficient mice. At the inner surface of the cortical plate, we noticed more irregularly spaced subplate cells and an increased immunoreactivity for synaptophysin within the cortical plate itself, together pointing towards a premature immigration of thalamic axons into the cortical plate and thus a defective subplate function as a novel aspect of the PSEN1 deficient phenotype.

Kategorie: Poster

Poster 181:

Titel:Aerosol based cell and tissue cultivation: an alternative cell culture technique

Autoren: von der Ruhr J.(1),Schmidt T.(1),Abendroth D.(1),Seid K.(1),Just L.(1),

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Abstract:
In conventional culture systems, cells and tissues are mainly kept in cell culture medium (submerged cell culture) or at the interface between air and culture medium (air/liquid culture). We developed a principally new culture technique by which the cultivated cells are continuously surrounded and supported with aerosols of culture medium. This concept provides an efficient nutrient and gas supply to cells and allows to culture tissue constructs with less restrictions in shape and size. Using this aerosol based technology we are able to demonstrate the proliferation and specific differentiation of various mesenchymal and neural cells in a nebulous environment. The successful long-term cultivation strongly depends on the manner of aerosol generation, the distribution of aerosol droplets and on the design of the culture chamber. This method offers novel possibilities in the engineering of complex three-dimensional cell and tissue constructs. In addition, it is particularly suited for the pharmacological testing of aerosol bound bioactive substances, such as drugs, toxins, virus particles, or synthetic nanoparticles.

Kategorie: Poster

Poster 182:

Titel:Thalamus pathology in multiple sclerosis: from biology to clinical application

Autoren: Wagenknecht N.(1),Kipp M.(1),

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Abstract:
Multiple Sclerosis (MS) is more than an inflammatory disease: it harbors several aspects of a classical neurodegenerative disorder, i.e. damage of axons, synapses and neuronal cell bodies. While the clinician is equipped with appropriate tools to prevent immune-cell driven relapses, effective therapeutic options to prevent neurodegeneration are still missing. During clinical neuroprotective trials, methods to monitor progression of neurodegeneration are still in its infant and their validity not yet proven. In this project we elaborate whether or not the thalamus due to its extensive reciprocal connections with various cortical and subcortical structures might be an ideal region of interest to monitor during clinical neuroprotective trials. To better understand the effects of widespread (neuro-) inflammation on thalamic pathology, we used two distinct MS animal models, i.e. cuprizone-induced toxic demyelination and experimental autoimmune encephalomyelitis (EAE). In the cuprizone model, specific subregions of the thalamus, namely the ventral posterolateral nucleus, the ventral posteromedial nucleus and the ventral anterior-lateral nucleus are demyelinated, paralleled by microgliosis and acute axonal damage. In contrast, thalamic pathology was less distinct in the EAE-model, despite severe inflammation in the cerebellum and spinal cord. Anterograde transneuronal degeneration occurs when a neuron is damaged and causes the degeneration of a postsynaptic neuron. Since the thalamus is not directly affected in the EAE model, but thalamic afferents/efferents are, future studies have to show whether neuronal cell death occurs in the thalamus due to axonal transection of efferent or afferent pathways.

Kategorie: Poster

Poster 183:

Titel:Brush cells release acetylcholine for paracrine and autocrine signaling

Autoren: Wiederhold S.(1),Jurastow I.(1),Rafiq A.(2),Deckmann K.(1),Schütz B.(3),Weihe E.(3),Kummer W.(1),Krasteva-Christ G.(1),

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Abstract:
Recently, we have identified tracheal brush cells as being chemosensory and cholinergic. They initiate protective reflexes in response to bacterial and bitter tasting substances utilizing cholinergic signaling. Here, we further explored the cellular pathways triggering ACh release and subsequent para- and autocrine feedback loops. Brush cells responded to the bitter substance denatonium (1 mM, 25 mM) with an immediate increase in [Ca2+]i. Paracrine signaling events were monitored utilizing biosensor cells expressing muscarinic ACh receptor M3. Biosensor cells were sensitive to 100 nM-100 µM ACh and did not respond to 1 mM denatonium. When positioned near brush cells and stimulated with denatonium, ACh-biosensor cells showed a delayed increase in [Ca2+]i. Atropine (50 µM) eliminated the response in the ACh-biosensor cells and attenuated the increase of [Ca2+]i in brush cells. Taste transduction signaling cascade inhibitors (U-73122/TPPO) abolished the responses of brush cells to denatonium and the subsequent responses of ACh-reporter cells. Interestingly, other epithelial cells also responded to 25 mM denatonium. One population showed a moderate increase in [Ca2+]i, resistant to the cholinergic inhibitors atropine and mecamylamine. The second population showed sharper and higher increase in [Ca2+]i that was abolished by these inhibitors. In brush cells, an atropine/mecamylamine mixture reduced the [Ca2+]i-response to 25 mM denatonium. In conclusion, the canonical taste transduction signaling cascade is essential for denatonium-mediated activation of brush cells. The subsequent release of ACh magnifies this response in an autocrine manner and leads to paracrine stimulation of a subpopulation of tracheal cells.

Kategorie: Poster

Poster 184:

Titel:Longitudinal analysis of mr spin-spin relaxation times (t2) in medial femorotibial cartilage of adolescent vs. mature athletes: dependence of deep and superficial zone properties on sex and age

Autoren: Wirth W.(1),Eckstein F.(1),Boeth H.(2),Diederichs G.(3),Hudelmaier M.(1),Duda G.(2),

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Abstract:
Objective: Cartilage spin-spin MRI relaxation time (T2) represents a promising imaging biomarker of “early” osteoarthritis (OA) known to be associated with cartilage composition (collagen integrity, orientation, and hydration). However, no longitudinal imaging studies have been conducted to examine cartilage maturation in healthy subjects thus far. Therefore, we explore T2 change in the deep and superficial cartilage layers at the end of adolescence. Methods: Twenty adolescent and 20 mature volleyball athletes were studied (each 10 men and 10 women). Multi-echo spin echo (MESE) images were acquired at baseline and 2-year follow-up. After segmentation, cartilage T2 was calculated in the deep and superficial cartilage layers of the medial tibial (MT) and medial weight-bearing femoral (cMF) condyles, using 5 echoes (TE 19.4-58.2ms). Results: 16 adolescent (6 men, 10 women, baseline age 15.8±0.5y) and 17 mature (9 men, 8 women, age 46.5 ±5.2y) athletes had complete baseline and follow-up images of sufficient quality to compute T2. In adolescents, a longitudinal decrease in T2 was observed in the deep layers of MT (-2.0ms; 95% confidence interval: [-3.4,-0.6] ms; $p<0.01$) and cMF (-1.3ms; [-2.4,-0.3]ms; $p<0.05$), without obvious differences between males and females. No significant change was observed in the superficial layers, or in the deep or superficial layers of the mature athletes. Conclusion: In this first pilot study on quantitative imaging of cartilage maturation in healthy, athletic subjects, we find evidence of cartilage compositional change in deep cartilage layers of the medial femorotibial compartment in adolescents, most likely related to organizational changes in the collagen matrix.

Kategorie: Poster

Poster 185:

Titel:Characterization of the cmv-specific cd4 cell response

Autoren: Wunsch A.(1),Mills A.(2),Sundararaman S.(2),Hanson J.(2),Caspell R.(2),Kuerten S.(1),Lehmann P.(3),

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Abstract:
Most humans become infected with the human cytomegalovirus (HCMV). Typically, the immune system controls the infection, but the virus persists and can reactivate in states of immunodeficiency. While the HCMV-specific CD8 cell and antibody response has been accessible to investigation, studies of CD4 cell subsets have been limited by the low frequency of the antigen-specific CD4 cell subclasses in peripheral blood mononuclear cells (PBMC). Using ELISPOT that excels in low frequency measurements we have established parameters of CD4 cell immunity in a cohort of 40 healthy HCMV controllers, thereby providing reference values against which CD4 cell reactivity can be compared when the immune surveillance fails. The HCMV-induced ELISPOT count was established in 250,000 PBMC/well measuring the frequency of IFN-gamma-, IL-2-, IL-4- and IL-17-producing cells, as well as those co-expressing IL-2 and IFN-gamma. Cytokine recall responses were seen in 32 of 40 donors (80%). IFN-gamma recall was seen in all positive donors, with the exception of 3 donors, in which IL-17 was detected in the absence of IFN-gamma, suggesting that both TH1 and TH17 immunity â€“ individually or jointly - is consistent with a controller status. While IL-4 recall occurred in 18 donors (45%), it was absent in isolation, suggesting that isolated TH2 immunity is not compatible with a controller status. One-fourth of the IFN-gamma-positive donors were IL-2 negative, and thus did not possess detectable numbers of polyfunctional CD4 cells. While polyfunctional CD4 cells could be detected in the majority of donors, they do not seem to be essential for a controller status.

Kategorie: Poster

Poster 186:

Titel:Myelination patterns of the brain in healthy infants

Autoren: Yurttas Saylam C.(1),Eraslan C.(2),Sener N.(3),Steinbusch H.(4),

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Abstract:
Postnatal brain development is related with the process of myelination, the ensheathment of axons with myelin by oligodendrocytes.The objective of our study was to describe the milestones of brain development with MRI(Magnetic Resonance Imaging) patterns of myelination by T1-and T2-weighted images,spectroscopy and diffusion MRI from the 3.day to 24.month on 100 healthy infants.By 2 months myelination appears in the genu of internal capsules on T1,by 3 months in anterior limbs of internal capsules and in splenium of corpus callosum on T1,by 6 months genu of corpus callosum has high signal on T1,by 8 months myelination complete in corpus callosum,by 8-10 months myelination complete in external capsule,by 11-12 months myelination complete in anterior limb of internal capsule on T2,by 24 months myelination complete in U-fibers on T2,3-day-old spectoscopy shows choline dominant and myoinositol prominent,on 20-day-old N-Acetylaspartic acid increased.On diffusion MRI the 4-day-old ADC (apparent diffusion coefficient)values in gray matter was 1.23 X10-3 mm2/sec in white matter 1.82 X10-3 mm2/sec.The 2-month-old ADC values were Thalamus: 0.97 X10-3 mm2/sec and Frontal: 1.56 X10-3 mm2/sec.The 6-month-old ADC values were C.callosum: 0.68 X10-3 mm2/sec,thalamus: 0.74 X10-3 mm2/sec and periatrial: 1.18 X10-3 mm2/sec.Myelination is best evaluated by T1-weighted MR images during the first 6 months of life .After age 6 months T2-weighted MR images are useful and showed adult pattern by 20 months.Myelination progresses in the brain from inferior to superior, posterior to anterior and center to periphery.

Kategorie: Poster

Poster 187:

Titel:Regulation of the inflammasome by intrathecal application of sdf-1 in a spinal cord injury model

Autoren: Zendedel A.(1),Kipp M.(1),Johann S.(1),Beyer C.(1),

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Abstract:
Stromal cell-derived factor-1 alpha (SDF-1alpha) is an important cytokine which has multiple roles during cell migration, survival and proliferation. The inflammatory response initiated by spinal cord injury (SCI) involves activation of interleukin-1beta (IL-1beta) and IL-18. The processing of the pro-inflammatory cytokines IL-1beta and IL-18 is mediated by activation of caspase-1 which is under the control of an intracellular multiprotein complex termed inflammasome. Using the SCI model, we found shown improved functional neural long-term recovery paralleled by a reduction of apoptosis after treatment with SDF-1alpha. An intriguing aspect is that SDF-1alpha changed the number of neuroinflammatory cells in the damaged area. The present study examined the cellular distribution and dynamic expression of several inflammasomes during SCI at different time points (6h, 24h, 3 and 7d) and the role of SDF-1alpha in the regulation of inflammasomes . After SCI, rats were exposed to SDF-1alpha/PBS through an intrathecal catheter using an osmotic pump. SCI temporally increased the mRNA expression of the inflammasomes NLRP3, AIM2, NLRC4, inflammatory markers (iNOS, TNF-alpha), and IL-1bete and IL-18. SDF-1alpha significantly reduced the levels of IL-18, TNF-alpha, NLRP3, ASC, caspase-1 and NLRC4. Our data provide clear evidence that SCI stimulates a complex scenario of inflammasome activation in the injured site and that SDF-1alpha-mediated neuroprotection presumably depends on the regulation of the inflammasome complex.

Kategorie: Poster

Poster 188:

Titel:The arterial blood supply of the helical rim and the earlobe based advancement flap for helical rim reconstruction - a new concept

Autoren:Zilinsky I.(1),Cotofana S.(2),Hammer N.(3),Feja C.(3),Ebel C.(4),Stavrou D.(1),Haik J.(1),Farber N.(1),Winkler E.(1),Weissman O.(1),

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Abstract:
There are many techniques described for reconstruction of helical rim defects including Antia and Buch’s ingenious time honed technique. Still, all these techniques either produce unsatisfying aesthetic results or are time consuming as well as technically challenging. Herein we present the Ear Lobe Based Advancement Flap (ELBAF) technique and its anatomical basis. A case series of 10 patients with full thickness helical rim defects of up to 3.8 centimeters in length were reconstructed using the ELBAF and followed up for the occurrence of complications and evaluation of aesthetic results. An anatomical essay that included cadaver dissection and utilizing a corrosion technique was performed. A case series of 10 patients with full thickness helical rim defects of up to 3.8 cm underwent reconstruction using the ELBAF successfully, with satisfying aesthetic results. No complications related to the technique were encountered. Cadaver dissections demonstrated that there is a consistent blood supply to the earlobe area emerging from the superficial temporal artery that forms a capillary system in the earlobe area, producing arteries that run circularly along the helical rim. Based on this axial vessel pattern, the ELBAF can be easily and safely used to reconstruct full thickness helical defects of up to 3.8 cm in length.

Kategorie: Poster

Poster 189:

Titel:Magnetic beads induced experimental glaucoma model in rats

Autoren: Zurl A.(1),Krefft K.(1),Marschallinger J.(2),Schrödl F.(3),Bogner B.(1),Kaser-Eichberger A.(1),Bruckner D.(1),Runge C.(1),Aigner L.(2),Reitsamer H.(1),

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Abstract:
Introduction: Glaucoma is a multifactorial, neurodegenerative disease, characterized by the progressive loss of retinal ganglion cells (RGCs) and their axons, leading to visual impairment and blindness. The exact pathogenesis is not clear yet, however, one of the major risk-factors is elevated intraocular pressure (IOP). By establishing an ocular hypertension (OHT) model in rat we aim to quantify RGC-loss after IOP-increase in a time dependent manner and to determine the optimal time-frame to test neuroprotective substances in glaucoma. Methods: Glaucoma was induced unilaterally by injection of 8µm-paramagnetic microspheres into the anterior chamber of Brown Norway rats. IOP was measured in awake rats once a day. Animals were sacrified 4/7/10/14 and 21-days after microsphere injection. Whole mount retinas of the injected and control eye were analyzed by immunohistochemistry. Specific markers were used to visualize RGCs (Brn3a) and their axons (NF200). Stainings were documented by confocal microscopy. Results: After 7 days of IOP increase, a significant RGC loss was detected in central (p=<0,001), middle (p=0,019) and peripheral retinal regions (p= 0,018). RGCs-loss was significant at all later time points investigated (10d/14d/21d, each n=5) in the three retinal regions. A clear correlation between RGC-loss and continuous OHT was shown. Conclusion: We sucessfully established a magnetic microbeads based experimental glaucoma model which leads to a reliable and constant elevation of IOP and significant RGC-loss after 7-days. By performing these time-series-experiments we determined 7-14-days of OHT as optimal time-frame to test the effectiveness of neuroprotective substances to prevent RGC death in experimental glaucoma.

Kategorie: Poster

Poster 190:

Titel:Genderspecific differences in the distribution of dlk(pref1)+ cells in human white subcutaneous adipose tissue

Autoren: Zwierzina M.(1),Fritsch H.(1),Pechriggl E.(1),Bitsche M.(1),Zwerschke W.(2),Rostek U.(2),Mitterberger M.(2),

Adressen:(1)Department of Anatomy, Histology and Embryology, Innsbruck Medical University|Division of Clinical and Functional Anatomy|Innsbruck|Austria; email:helga.fritsch@i-med.ac.at; (2)Institute for Biomedical Aging Research, University of Innsbruck|Cell Metabolism and Differentiation Research Group|Innsbruck|Austria

Abstract:
PURPOSE: Adipose-derived stem cells (ASCs) represent a population of multipotent cells with the capacity to differentiate into several lineages. According to our former findings, DLK1(PREF1) appears to be a proper marker to define ASCs in human white subcutaneous adipose tissue. Analyzing the distribution of ASCs in different subcutaneous body regions of males and females will eventually allow us to define the preferable collection site for these cells, being of special interest in regenerative medicine. AIM: We would like to show gender- and site-specific differences in the distribution of ASCs in human white subcutaneous adipose tissue. MATERIAL and METHODS: Human subcutaneous adipose tissue samples from fresh cadavers were matched according to age, BMI, cause and time of death. Sections of the lower abdomen, hip and breast were examined by immunohistochemistry and immunofluorescence according to their expression pattern of DLK1(PREF1). Evaluation for number and distribution was carried out using an image analyzer (MetaMorph). Statistical analysis was performed to compare number of adipocytes and ASCs by site and gender. RESULTS: Our results demonstrate that DLK1(PREF1)+ cells preferentially reside in perivascular niches but are also located more peripherally without any relation to blood vessels. In relation to the diameter of vessels, the total number of DLK1(PREF1) + cells count about a third to a sixth to the number of adipocytes. Further statistical analyses about site- and gender-specific differences will be discussed. CONCLUSION: DLK1(PREF1)+ cells represent a significant population in human subcutaneous adipose tissue. Site- and gender-specific differences in the distribution of these cells need to be considered.

Kategorie: Poster

Poster 191:

Titel:Urethral bitter stimuli activate brush cells and increase detrusor activity

Autoren: Deckmann K.(1),Krasteva-Christ G.(1),Rafiq A.(1),Klein J.(2),Bschleipfer T.(3),Kummer W.(1),

Adressen:(1)Institute of Anatomy and Cell Biology|Justus-Liebig-University|Giessen|Germany; email:Klaus-Deckmann@gmx.de; (2)Department of Pharmacology, School of Pharmacy|Goethe University|Frankfurt am Main|Germany; (3)Department of Urology, Pediatric Urology and Andrology|Justus-Liebig-University,|Giessen|Germany

Abstract:
Previously we identify chemosensory cells (“brush cells”) in the murine urethral epithelium, but not in further centrally located parts of the urinary tract such as bladder, ureter and renal pelvis. These newly recognized cells express bitter and umami taste receptors and downstream components of the classical taste transduction cascade. Accordingly, they respond to stimulation with bitter and umami with an increase in intracellular calcium concentration. Here, we investigated the mechanisms triggered by urethral bitter stimuli. Stimulation with the bitter substance denatonium benzoate (25 mM) evoked release of acetylcholine in the supernatant of isolated urethral cells. In co-culture, both brush and non-brush cells responded to denatonium with an increase in intracellular calcium concentration. The response of non-brush cells was abolished by a cholinergic blocker cocktail (atropine, mecamylamine), demonstrating cholinergic paracrine signaling. Immunohistochemistry revealed sensory nerve fibers expressing nicotinic acetylcholine receptors (nAChRalpha3, eGFP-reporter mice) in close proximity to urethral brush cells. The functional consequences of a link to sensory nerve fibers were investigated by cystometry in anesthetized rats. First, we validated the occurrence of brush cells in the rat urethra by immunohistochemical detection of brush cell specific markers (villin, choline acetyl transferase, alpha-gustducin, PLCbeta2 and TRPM5). Intraurethral application of denatonium reflexively increased activity of the bladder detrusor muscle which was partly antagonized by mecamylamine, an nicotinic acetylcholine receptor blocker. In conclusion, we propose a concept of urinary bladder control involving a newly recognized cholinergic chemosensory cell monitoring the chemical composition of the urethral luminal microenvironment for potential hazardous content.

Kategorie: Poster

Poster 192:

Titel: Effects of long-term losartan treatment during epileptogenesis on the development of chronic epileptic state and diurnal rhythms of behavioural changes in Wistar rats

Autoren: Atanasova D.(1) (2),Ivanova N.(1),Tchekalarova J.(1),Lazarov N.(1)(3),

Adressen:(1)Institute of Neurobiology; |Bulgarian Academy of Sciences|Sofia|Bulgaria; (2)Institute of Experimental Morphology, Pathology and Anthropology with Museum|Bulgarian Academy of Sciences|Sofia|Bulgaria; email:didi.atanasova@yahoo.com; (3)Department of Anatomy and Histology|Medical University of Sofia|Bulgaria

Abstract:
Background: The brain renin-angiotensin system is related to pathophysiological responses associated with anxiety, depression and seizures mainly through the angiotensin II/AT1 receptor activation. Aim: The purpose of the study is to determine the effects of long-term treatment with a selective AT1 receptor antagonist losartan during epileptogenesis on the deleterious consequences of kainate (KA)-induced status epilepticus (SE) in Wistar rats. Methods: Spontaneous recurrent seizures (SRSs) were video and EEG-recorded during and after the treatment protocol. Anxiety and depressive-like behavior was explored with an open field test, elevated plus-maze test, forced swimming test and sucrose consumption test during the chronic epileptic phase. Neuronal damage in the hippocampus was analyzed by hematoxylin and eosin staining. Results: Losartan (10 mg/kg/day, in drinking water, 4 weeks) attenuated seizure activity by elongation of the seizure-latent period and decreasing the frequency of SRSs without changing the circadian distribution of SRSs. The AT1 receptor antagonist losartan restored diurnal behavioral variations and positively influenced epilepsy-associated behavioral changes, including impulsivity, low anxiety level and depression in a phase-dependent manner during the chronic epileptic phase. Losartan exerted neuroprotection selectively in the CA1 area of the hippocampus. Conclusion: Although the AT1 receptor antagonist losartan does not suppress the development of epileptogenesis, it exerts a disease-modifying effect on seizure activity, neuronal damage in the hippocampal CA1 area, prevention of part of the behavioral changes and restoration of diurnal behavioral variability. This work was supported by the European Social Fund and Republic of Bulgaria, Operational Programme “Development of Human Resources” 2007-2013, grant BG051PO001-3.3.060048.

Kategorie: Poster

Poster 193:

Titel:Beta-nicotinamide adenine dinucleotide (b-nad): the novel bronchodilator

Autoren:Jurastow I.(1),Krasteva-Christ G.(1),Von der Beck D.(2),Guenther A.(2),Klepetko W.(3),Bodner J.(4),Padberg W.(4),Kummer W.(1),

Adressen:(1)Institute of Anatomy and Cell Biology|Justus Liebig University|Giessen|Germany; email:Innokentij.Jurastow@gmx.de; (2)Dept of Internal Medicine II|Universities of Giessen and Marburg Lung Center|Giessen|Germany; (3)Department of Surgery|Medical University of Vienna|Vienna|Austria; (4)Department of General and Thoracic Surgery|University Hospital of Giessen|Giessen|Germany

Abstract:
RATIONALE: B-NAD has been reported as a sympathetic neurotransmitter relaxing vascular and intestinal smooth muscle via purinergic receptors. We here tested for its ability to relax airway smooth muscle. METHODS: Force development of murine trachea and human bronchioli was investigated in organ bath experiments, bronchoconstriction of intrapulmonary airways by videomicroscopic analysis of precision-cut lung slices (PCLS. Calcium measurements were made in cultivated murine and human airway smooth muscle cells (ASM) and in bronchial smooth muscle (BSM) simultaneously with measurements of membrane potential and luminal area. RESULTS: Airways precontracted with muscarine (10 µM) dose-dependently relaxed with a maximum response at 5 mM b-NAD. In trachea and human bronchioli, it reduced muscarine-induced contraction completely, thereby proving to be as potent as salbutamol (beta-2-adrenoreceptor agonist). Muscarine-induced narrowing of bronchi was nearly totally reversed. In contrast to its reported action via purinergic receptors in intestinal smooth muscle, the airway relaxing effect of b-NAD was resistant to purinergic blockers, which were effective in inhibiting ATP-induced relaxation. B-NAD relaxation was unaffected by inhibition of G(s)- and G(i)-signaling with pertussis toxin and cholera toxin, respectively, and also insensitive to PLC inhibition. Isolated ASM and BSM in PCLS responded to b-NAD with an increase in intracellular calcium concentration and depolarization of the cell membrane during relaxation. CONCLUSION: b-NAD is a novel identified relaxant of airways acting via G-protein independent pathways, possibly involving compartmentalized increase in calcium concentration and depolarization of the cell membrane. Potentially it represents a new therapeutic tool in obstructive airway diseases.

Kategorie: Poster

Poster 194:

Titel:Brain corticosteroid-binding globulin (cbg): intrinsic expression and involvement in central stress response

Autoren:Sivukhina E.(1),Jirikowski G.(1),

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Abstract:
The neuroendocrine basis of stress response includes activation of the hypothalamo-pituitary-adrenocortical axis. Glucocorticoids (GCs)- as major stress hormones-have both central and peripheral effects. Among the factors regulating their availability to target tissues are levels of corticosteroid-binding globulin (CBG). Our recent findings demonstrated intrinsic expression of CBG in various brain regions and in different cell populations (neurons and glial cells). We found the presence of CBG in the human hypothalamus, where it was co-localized with the classical neurohypophyseal neurohormones-vasopressin and oxytocin. We demonstrated by full-length sequencing of hypothalamic CBG that the same gene encodes both brain and liver CBG in mouse. Thus, we confirmed the local production of CBG mRNA within various cerebral regions. CBG expression seemed in part to be independent from known nuclear glucocorticoid receptors (GRs) as observed with double immunostaining. Although brain levels of CBG encoding mRNA are about 200 times lower than in liver, the wide distribution of the binding globulin led us to suggest that brain CBG may play a significant role in neuroendocrine signaling. CBG made in certain neurons may aid internalization and delivery of GCs into neurons and within the cell. Rapid, non genomic effects of GC may be mediated through CBG and a putative membrane receptor. Brain CBG may be involved in responses to changing systemic GC levels either additionally to known GRs or in GC-responsive brain regions devoid of these receptors. Undoubtedly the multiple locations of CBG within the central nervous system imply multiple functional properties in normal and/or pathological conditions.

Kategorie: Poster