

Poster Abstract Booklet

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Abstracts are arranged in the same order as lectures are presented during the congress

Titel:Locally expressed TGF beta3 in squamous metaplasia: an incidental finding in the porcine oviduct epithelium

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Abstract:

Purpose: There is growing evidence that the production and secretion of transforming growth factor beta (TGF beta) family members in the oviduct could influence the development and differentiation of the pre-implantation embryo. However in livestock animals, there is a lack of information about the abundance of TGF beta in the oviduct.

Methods: The localization of TGF beta3 protein in the porcine oviduct was evaluated by immunohistochemical analysis of paraffin-embedded tissue sections. A total of 22 pigs of the German Landrace were slaughtered at different stages of the oestrus cycle and pregnancy.

Results: TGF beta3 immunostaining was present predominantly in blood vessels of all stages examined. At di- and prooestrus, moderate staining was seen in endothelial and smooth muscle cells of arterioles situated outside of mucosa. Staining intensity decreased slightly in arterioles within the oviduct stroma. Muscle cells were stained faintly, whereas oviduct epithelium showed TGF beta3 staining similar to background staining. Surprisingly, one of the female pigs showed foci of squamous metaplasia in the epithelial linings, which were specifically immunostained with anti-TGF beta3.

Conclusions: TGF beta3 is not directly involved in porcine embryonic development, but may be a potential marker of selectively transformed epithelium.

Category: Poster

Titel:Structural and functional characterization of ampulla and isthmus in the mouse oviduct

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Abstract:

Ciliated cells of the oviduct communicate with and transport the cumulus-oocyte-complex and the embryo. As a basis of future experiments utilizing gene-deficient mice to analyze this interaction, we set up to investigate basic structural and functional characteristics of oviductal segments in specified pathogen-free C57Bl6 mice (>10 weeks) at all cyclic stages (prooestrus, oestrus, metoestrus and dioestrus). The relative frequency of ciliated cells was evaluated at 4 µm thick HE-stained paraffin sections. Ciliary function was assessed by measuring particle transport speed (PTS) on opened segments of ampulla and isthmus with a videomicroscopic system. Cyclic stages had no impact upon relative ciliated cell frequency and upon PTS. Ciliated cell frequency accounted to 63-81% in the ampulla, whereas only 1-31% were observed in the isthmus. In contrast to the trachea, where basal PTS accounted to 10-20 µm/s and could be effectively stimulated by ATP (10⁻⁴ M) in the trachea, basal PTS in the ampulla was high 50-70 µm/s and could not be further stimulated. In the isthmus region, effective particle transport was only barely observed. The high basal PTS in the ampulla was maintained in muscarinic receptor M1 gene-deficient mice, although this strain shows markedly reduced basal PTS in the trachea. These findings show conspicuous structural and functional differences in ampulla and isthmus in the mouse oviduct that keep conserved throughout cyclic changes. The high basal PTS in the ampulla might serve to maintain effective clearing of oviductal content throughout all cyclic stages. (DFG, KO 1398/5-1)

Category: Poster

Titel: Muscarinic and nicotinic acetylcholine receptor subtypes in the mouse oviduct

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Abstract:

Acetylcholine (ACh) is not only a well known neurotransmitter, it is also an important signaling molecule in non-neuronal tissues. Recently, its presence has been demonstrated in the oviduct, where it might stimulate the contraction of the smooth muscle cell layer and/or ciliary beat frequency. Both mechanisms influence the transport of the oocyte to the uterus. We analyzed the distribution of cholinergic nerve fibers and investigated the expression of the muscarinic ACh receptor subtypes M1-M5 and the ligand-binding subunits (alpha-subunits) of the nicotinic ACh receptors (nAChR) in the mouse oviduct. Using acetylcholinesterase histochemistry we could not detect cholinergic nerve fibers in the oviduct. We analyzed the expression of ACh receptors separately in ampulla, isthmus and uterotubar junction by RT-PCR. Expression of M1 and M3 receptors was predominant. M2 receptor mRNA was regularly but less abundantly expressed, and M2 receptor protein was not found in the smooth muscle cell layer, its dominant localisation in the airways. M4- and M5-receptor mRNAs were not constantly detected. Among the nAChR subunits, alpha4 and alpha7 were predominantly expressed. Subunit alpha2 was constantly detected at a lower level whereas neither alpha6 nor alpha9 subunits were found. Subunits alpha3, 5 and 10 were interindividually expressed. No differences in muscarinic and nicotinic receptor expression were observed between ampulla, isthmus and uterotubar junction of the oviduct.

The data show the presence of multiple ACh receptor subtypes in the oviduct in the absence of cholinergic innervation, supporting the concept of a non-neuronal cholinergic system in the oviduct. (DFG, KO 1398/5-1)

Category: Poster

Titel:Laser capture microdissection and qPCR as tools to study gene expression in the bovine oviduct

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Abstract:

Purpose:

The aim of our study was the quantification of several low and middle copy genes of the bovine oviduct using quantitative PCR (qPCR)

Material/Methods:

Laser capture microdissection and qPCR were used to analyse the mRNA expression profile

of oviductal glycoprotein (OVGP1), estrogen (ER) and progesterone receptor (PR) in different cellular compartments (epithelium, lamina propria) of two segments (ampulla, isthmus) of the bovine oviduct.

Results:

Protocols for fixation, preparation and isolation of total mRNA from bovine oviductal single cells samples were evaluated and optimized. Our results clearly show that quality and quantity of the mRNA of isolated oviduct cells were significantly influenced by sampling procedures, proteinase-K digestion, primer design and several modification of the qPCR protocol.

Conclusion:

Laser capture microdissection in combination with qPCR is a reproducible and reliable technique for quantification of a small number of cells from formalin fixed and paraffin embedded material.

This study was supported by a grant of the DFG (si 279/7-3)

Category: Poster

Titel: The pro-angiogenic factor CYR61 is regulated by EGF and estrogen activated pathways in endometrial cells

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Abstract:

CYR61 is a growth-factor inducible gene, which plays a fundamental role in angiogenesis and tumorigenesis. In the human endometrium, CYR61 shows a particularly high expression during the proliferative phase. Therefore, we examined the influence of proliferative mediators estrogen and EGF on the CYR61 mRNA expression in endometrial epithelial cells (HES).

Application of 17beta-estradiol led to a significant upregulation of CYR61 mRNA expression after 2h via estrogen receptors as evidenced by simultaneous incubation with the antiestrogen ZK191703.

Treatment with EGF, leading to phosphorylation and internalisation of the EGF receptor, showed significant induction of CYR61 expression already after 30 minutes. Treatment with EGF and estrogen synergistically induced CYR61 mRNA after 2h. Addition of an antiestrogen reduced the synergistic effect to control levels confirming the involvement of the estrogen receptor. However, an inhibition of C-terminal EGFR by AG1478 did not reduce CYR61 levels. Next, we studied the EGF induced MAP-kinase/ERK pathway. Surprisingly, the HES-cells revealed an upregulation of CYR61 mRNA expression after inhibition of the MAPK/ERK pathway upon EGF treatment.

We could give evidence that the EGF signalling pathway was mediated by JAK2/STAT3 as revealed by simultaneous application of EGF with the inhibitors AG490 and a specific STAT3 inhibitor, respectively.

In conclusion, EGF mediated CYR61 mRNA regulation in HES cells involves STAT proteins but not the EGFR/MAPK/ERK pathway, a cascade which was previously identified for the strong responsiveness of CYR61 to EGF in endometrial carcinoma cells. The relevance of this differently CYR61 regulation needs further evaluation.

Category: Poster

Titel:Hypoxia triggers the trophoblast giant cell pathway of murine trophoblast stem cells

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Abstract:

Purpose: To investigate the role of hypoxia in trophectoderm stem cell lineage differentiation in murine trophoblast stem cell (TS) lines.

Methods: Wildtype TS cells were cultured in a differentiating culture media for nine days under normoxia (20% O₂) or hypoxia (3% O₂). The proliferation rate was examined and the expression of mRNA for very early marker genes for TS cell lineage differentiation such as Cdx2 and Eomes were analyzed by qRT-PCR. Additionally the expression of Connexin 26 (Cx26) and Placental lactogen 1 (Pl-1) were investigated.

Results: The proliferation rate of TS cells cultured under hypoxia was significantly reduced compared to TS cells grown under normoxic conditions.

Furthermore TS cells kept under hypoxia showed a decreased level of Cdx2 and Eomes. The gap junction protein Cx26- a marker for the labyrinthine syncytiotrophoblast - showed also a reduced amount of transcripts, whereas

Pl-1 - which is specific for the trophoblast giant cells- revealed an increased transcription level in a low oxygen environment. Microscopic analysis confirmed the increased number of trophoblast giant cells in TS cells cultured under hypoxia.

Conclusions: The differentiation process is indicated by a decreased expression of the early stem cell markers mostly responsible for maintaining stem cell character and proliferation under hypoxia. Like in early pregnancy TS cells probably favour the trophoblast giant cell pathway instead of the labyrinthine pathway.

Category: Poster

Titel: Characterization of the dendritic cell population in rat testis and its potential in the prevention of testicular autoimmune disease

Authors: Fijak M, Guazzone V, Lustig L, Hackstein H, Schneider E, Rival C, Meinhardt A

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No abstract available

Titel:Luteinizing hormone receptor expression in the spongius tissue

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Abstract:

Purpose: The proportion of men with serum Luteinizing Hormone (LH) > 6.0 U/l and serum testosterone > 9.8 nmol/l, i.e. of men with subclinical hypogonadism, increases significantly between 40 and 70 years. As the proportion of men with erection disturbances increases simultaneously, it is possible that the elevated LH concentrations are involved in the generation of the erection disturbances. The precondition for this is the expression of LH receptor in the spongius tissue. In the present study, the expression of the LH receptor in the male mouse spongius tissue was studied to see, if LH effects are possible in the spongius tissue.

Methods: Balb/c mice were used as donors of normal penis spongius tissue and testis tissue. Immunocytochemistry, Western blotting and quantitative RT-PCR reactions were used for the detection of the LH receptor.

Results: Positive immunoreaction for the LH receptor was found in the mouse penis spongius tissue using immunocytochemistry. Western blotting experiments demonstrated the presence of LH antigen at Mr = 97.4 and 78 kD. Quantitative RT-PCR reactions confirmed the expression of LH receptor in the spongius tissue.

Conclusions: Our results suggest that LH receptor is expressed in the male spongius tissue of the mice and thus the elevated LH levels of the aging men with subclinical hypogonadism may affect the spongius tissue.

Category: Poster

Titel: Expression and localization of SLC10A4 in murine and human urothelium

Authors: Wunsch J.(1), Geyer J.(2), Burger S.(2), Bschleipfer T.(3), Schukowski K.(3), Weidner W.(3), Illig C.(1), Möller S.(1), Lips K.(1),

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Abstract:

SLC10A4 is a novel orphan carrier protein belonging to the “sodium/bile cotransporter family”, SLC10. Recently, it was demonstrated that SLC10A4 is specifically expressed in cholinergic neurons of the rat central and enteric nervous system. The functional properties of SLC10A4 are, however, unknown. Here, we asked whether SLC10A4 is expressed in the non-neuronal cholinergic system of the murine and human bladder.

We addressed this issue with qualitative and real-time RT-PCR and immunohistochemistry. Using RT-PCR we detected SLC10A4-mRNA in abraded urothelium of mouse and in human urothelial biopsies. No regulation was observed in biopsies from patients with bladder outlet obstruction. On the protein level SLC10A4 was localized in all layers of the urothelium, in endothelial cells as well as in nerve fibers where it was colocalized with the vesicular acetylcholine transporter (VACHT).

In conclusion, this results show that SLC10A4 is an additional molecular component of the neuronal as well as non-neuronal cholinergic system of the bladder. In previous studies we could neither detect organic cation transporter 2 (OCT2) nor VACHT in the urothelium. VACHT shuffles acetylcholine (ACh) from the cytosol into synaptic vesicles from where ACh is released via vesicular exocytosis. OCT1 and OCT2 are able to release ACh directly from the cytoplasm. Recently, microdialysis studies on human skin revealed ACh release that was resistant to inhibition of both vesicular exocytosis and OCTs. Thus, SLC10A4 might be a transporter that mediates the release of ACh simultaneously to OCT1 in mouse and human bladder.

Category: Poster

Titel:Electronmicroscopic changes of the neural structures in the congenital megaureter

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Abstract:

Congenital dilatation of the ureter is frequently associated with other anomalies of the urinary tract. Considered in the past as an aplasia of the neuromuscular tissue, the congenital dilated ureter presents interest in what concerns the degree of alteration of its structures. Fragments of congenital megaureter drawn intraoperatory from children in the first year of life were prepared for electron microscopy study, using the usual technique, superstained with acetate of uranyl and lead citrate. Preparates were examined at TEM, at magnifications from 1850x to 3200x. In congenital megaureter the fascicles of myelinic and amyelinic fibers are dissociated by connective tissue. In the myelin sheath there are partial unorganized thickenings that alternate with vacuolizations. The myelin sheath thickenings either present as a whirl or as nodules. The unorganized myelin fibers surround axons that present vacuolizations, condensed mitochondria and dilated neurotubules. The neurofilaments are disorganized. Some myelin fibers partially maintain their structure, even in axons that present changes such as vacuolizations. The alterations of the neural structures in the congenital megaureter contribute to the peristaltic compromise. Megaureters with diminished or even lacking motility are described as displasic.

Category: Poster

Titel: Morphometric characteristics of sacrouterine and round ligament significant for uterine stability

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Abstract:

Purpose. Pelvic organ prolapse (POP) is downward descent of female pelvic organs, including the bladder, uterus or post-hysterectomy vaginal cuff, and the small or large bowel, resulting in protrusion of the uterus. It has been estimated that a half of parous women lose pelvic floor support, resulting in some degree of prolapse. The aim of this research is to determine morphometric characteristics of sacrouterine and round ligament in static and dynamic model on cadaveric samples in elderly women.

Methods. The research was carried out on 20 samples of sacrouterine and 20 samples of round ligaments. First of all, morphometrical analysis of both ligaments was done following the identical procedures. The length, breadth and thickness of each ligament from proximal to distal attachment site were taken, as well as volume of each uterus after extraction. After morphometrical studies the samples were histologically analysed at Clinical Hospital Osijek Department of Pathology and Forensic Medicine to determine chologen content per area unit. Described procedures was identical in studies of sacrouterine and round ligaments.

Results and conclusion. Using this methods chologen density as well as curvature of chologen structure are defined. With this data it's possible to explain better role of uterine ligaments in development of pelvic organs prolaps.

Category: Poster

Titel: Modifications in the pelvic statics after total hysterectomy

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Abstract:

Purpose: To evaluate the modifications in pelvis statics after total hysterectomy and the surgical possibilities to prevent and to correct them.

Methods: 200 female patients have been enrolled in this study. All of them had undergone total hysterectomy for benign uterine lesions. The patients were aged between 45 and 70 years. The occurrence of genital prolapse in 4 years follow-up, the period lapsed between hysterectomy and prolapse occurrence, the degree of functional modifications and the surgical procedures performed to correct these conditions were analyzed.

Results: 178 out of 200 patients had different types of modifications in pelvic statics: 87 patients had rectocele, 35 patients cystocele with urinary incontinence, and 66 cystorectocele. In all patients different surgical procedures were performed to strengthen the sustaining structures of pelvic organs. Conclusions: Surgical procedures to suspend the vaginal stump are useful to perform during total hysterectomy in order to avoid the urinary, genital and digestive postoperative dysfunctions.

Category: Poster

Titel: Functional and clinical anatomy of the pelvic floor muscles

Authors: Christian Wallner, Noshir F. Dabhoiwala, Marco C. DeRuiter, Wouter H. Lamers

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The pelvic floor muscles play a crucial role in pelvic-organ support and continence. We investigated serial sections of the pelvic floor of female and male fetuses and adults. Sections were stained (immuno)histochemically and 3D-reconstructions were prepared.

The levator ani and ischiocavernosus muscles have a bony attachment on one end, but the other attachment and all attachments of the remaining pelvic floor muscles (sphincters of urethra and anus, bulbospongiosus and 'transverse perineal muscles') are on soft tissue, often adjacent muscles.

The external urethral sphincter muscle has superior and inferior parts. The superior part is horseshoe-shaped with smooth muscle filling up the dorsal side to form a true sphincter. In females, the inferior part is a muscular sling that surrounds the urethra and fans out to the side of the vagina. In males, in the absence of a vagina, the arms of the sling reach toward the midline and surround the urethra.

The bulbospongiosus and ischiocavernosus muscle are situated inferior to the levator hiatus and should be considered as part of the pelvic floor. The existence of the 'transverse perineal muscles' is questioned. The 'superficial transverse perineal muscle' consists of a few muscle fibres that originate from the bulbospongiosus muscle and fan laterally towards the ischiocavernosus muscle. The 'deep transverse perineal muscle' is, in fact, the inferior part of the external urethral sphincter muscle.

Because of the muscle-muscle connections, each of the muscles can only function optimally if the other muscles are structurally intact. The levator ani muscle is often damaged during vaginal delivery. We did observe a case in which the attachment of the levator ani muscle to the pubic bone was disrupted unilaterally. Downward displacement the 'arcus tendineus levator ani' is also seen frequently. The architecture of the pelvic floor, as we describe it, explains why such injuries cause dysfunction.

Category: Poster

Title: Interstitial cells of Cajal are related to the smooth musculature of the anal sphincter complex

Authors: Kerschbaumer A, Putz D, Strasser H, Bartsch G, Fritsch H

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No abstract available

Titel: Periurethral supporting complex

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Abstract:

Purpose: To improve the understanding of muscular and connective tissue structures of the male pelvic floor and their positions to each other because of less data in male in contrast to the numerous investigations concerning urinary stress incontinence in female

Methods: Macroscopical and histomorphological investigations in 9 alcohol fixed cadaveric male pelvices, 6 of them paramedian sectioned. Selected tissues were prepared for immunohistochemistry.

Results: To warrant urinary continence, the correlation between bladder neck and membranous urethra are essential. A firm, hammock-like attachment to the symphysis and the lateral pelvic wall is realised by the puboprostatic ligaments, the tendineus arch of the pelvic fascia and the puboperinealis muscle. We found, that at first the puboprostatic ligaments are indeed a muscular structure, taking course from the symphysis to the detrusor muscle and have therefore to be renamed and their function new to be interpreted. Secondly, the tendineus arch of the pelvic fascia attaches in a furrow between bladder neck and basis of the prostate and was found to be the most important structure to hinder the organs from laterally slipping. Furthermore it enables the puboperinealis muscle, interacting with external urethral sphincter, for effective contraction.

Conclusions: We conclude that these findings may contribute to the improvement of existing techniques, curing prostate cancer with less side-effects.

Category: Poster

Titel: The double sling theory of the male pelvis

Authors: Weißenfels P.(1), Dartsch M.(1), Schwalenberg T.(2), Neuhaus J.(2), Stolzenburg J.(2), Löffler S.(1),

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Abstract:

Purpose: To close the gap of a complex male continence theory as a basis for reduction of currently high postoperative incontinence rates and the development of sufficient reconstruction techniques. For therapy of female urinary incontinence, techniques like tension free vaginal tape and transobturator tape are used, mostly based on the hammock-hypotheses by DeLancey and the integral theory by Petros and Ulmsten.

Methods: Macroscopical investigations in 9 alcohol fixed cadaveric male pelvises, 6 of them paramedian sectioned.

Results: Despite of well excepted opinions regarding the urethral sphincter as a central part of the closure apparatus we consider continence as a result of its interplay with the puboperinealis muscle, forming a muscular double sling which is integrated in perineal body. Moreover the tendineus arch of the pelvic fascia as an anchor of the organs in their physiological positions, has to be considered for reconstruction of the bladder neck. The latter inserts at the pubic bone and forms a connection to the tendineus arch of levator ani . If these structures are cutted or incised during radical retropubic prostatectomy the bladder neck region is displaced, leading to a decreased levator ani muscle effectiveness.

Conclusions: Considering the high relevance of the puboperinealis muscle and the tendineus arch of the pelvic fascia for male urinary continence feasible sparing techniques in prostatectomy should be aimed by future clinical trials.

Category: Poster

Titel: Neural tube closure defects (NTD) in the Meckel Anatomical Collections at the University of Halle, Germany

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Abstract:

Purpose: To re-evaluate the fetuses of the Meckel Anatomical Collections with NTD and to discuss the terminology of NTD during and after the Meckel period.

Methods: MRI, CT scanning and comparative genomic hybridization were used to investigate these fetuses.

Results and Discussion: In 1826, when Johann Friedrich Meckel (1781-1833), described "Hemicephalia", he had studied this condition for over 15 years and had assembled a collection of 24 specimens, which display this disorder to varying degrees concerning the preservation of the cranial vault and the cerebral hemispheres. "Hemicephalia" -today known as anencephaly- is classified as a NTD, and is almost always associated with malformations of the cranium. Based on the classification by closure site (Nakatsu et al. 2004), "Hemicephalia" is a form of upper NTD. Meckel was interested in malformations of both the cranium and the external parts of the head. Of the 24 hemicephalic fetuses discussed by Meckel, ten skeletons, two skulls, two integuments and two specimens preserved in alcohol are still available for study today. Various types of NTD have been described, ranging from craniorachischisis totalis, encephaloceles, iniencephaly, and spina bifida to microforms with sacrococcygeal dysgenesis. The etiology is extremely heterogeneous and involves gene-gene, gene-environment and gene-nutrient interactions. Here, we present essential material upon which Meckel based his descriptions. Moreover, our re-evaluation of 88 preparations led to the discovery of a wide range of NTD forms. In the present paper, we discuss the human fetuses with NTD under consideration of the pathogenetic mechanisms of neural tube closure.

Category: Poster

Titel:Subcutaneous chin fat compartments

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Purpose: To find out the borderlines of the subcutaneous compartments of the chin.

Methods: Subcutaneous injections of different coloured gelatine into the chin and submental areas.

Results: At the chin area we found very distinct borders: the lower border consisted of the submental ligaments, the lateral borders consisted of the labiomandibular grooves. The upward spreading of the gelatine ended at the level of the mentolabial groove.

The submental compartment did not show distinct borders. As the lower border there was found the hyoid ligament and as the upper border the submental ligaments. Laterally the injection fluid extended to the paramedian platysma retaining ligaments. Between the hyoid ligament and the paramedian platysma retaining ligament the border was not continuous. There the injection fluid could pass from the submental compartment into the surrounding subcutaneous fatty tissue.

Conclusions: Accumulation of fat of the chin compartment is limited strictly to this compartment. The labiomandibular groove becomes deeper and deeper. Accumulation of the fat of the submental compartment is not strictly limited to its compartment.

Category: Poster

Title: The course and the importance of the vertebral artery in the guinea pig.

Authors: Demirel B.(1), Demirel B.(1), Demirel B.(1), Sarikcioglu L.(1), Acikbas C.(2), Demir N.(3), Yildirim F.(1), Ucar Y.(1), Oguz N.(1),

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Poster was not presented.

Title:Collaten network changes in basilar artery in aging

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Abstract:

COLLAGEN NETWORK CHANGES IN BASILAR ARTERY IN AGEING

Objectives: The objective of the study was to examine and evaluate morphometrically age-related changes in collagen network in media of human basilar artery.

Materials and methods: The results of post mortem histological studies of the basilar artery from 89 individuals, whose age varied from 20 to 85 years are reported. The study has been carried out by histological routine, staining histological samples by Picro-sirius red. Detailed quantitative analysis of collagen bundles network in media of basilar artery was performed.

Results: We analyzed collagen network area, perimeter of its bundles and number of bundles in media of basilar artery. After investigation of age related changes in collagen network area in male and female, we determined that in both genders groups collagen network in media of basilar artery wall increased with age. Analyzing collagen bundles perimeter and bundles number in both genders according to the age, we found out that they were decreasing with age. We found statistically significant correlation between all the measured parameters and the age.

Conclusions: Collagen bundles area increased with age, bundles number and perimeter decreased with age in both genders in media of basilar artery. Collagen network structure, judging by in parallel decreasing total perimeter and number of bundles, became less branchy. It is feasible that separate collagen fibers merge and their cross section area enlarges. Quantitative parameters of collagen network: area, number and perimeter of bundles provided additional information about structural changes which occur in media of basilar artery in ageing.

Category: Poster

Title: Anastomoses between the cerebellar arteries. A corrosion cast study.

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Poster was not presented.

Title:Complexity of the parasellar internal carotid artery

Authors: Sattler S.J.(1),Meng S.(2),Geyer S.(1),da F. Costa L.(3),Weninger W.(1),

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Abstract:

The internal carotid artery (ICA) inside the parasellar region (cavernous sinus) is traditionally considered as the proximal part of the so-called carotid siphon and features the posterior knee of this siphon. However the true shape of the parasellar segments of the ICA (pICA) is corkscrew like. Since the complexity of a corkscrew can not be measured with goniometers, the angle of the posterior knee of the carotid siphon is used for estimating the complexity of the pICA. Our presentation aims at providing objective mathematical definitions of the pICA shape and evaluations of the significance of goniometric angle measurements for estimating the complexity of the pICA. Three dimensional (3D) models of 60 pICAs were generated from CT data. They were skeletonised using novel mathematical algorithms and the curvature and torsion energies of the 3D skeletons were calculated. We provide statistics of these data. In a second step the angle of the posterior knee of the carotid siphon was measured with the aid of a virtual goniometer in lateral projections of the 3D models and the results were compared with the curvature and torsion energy of the pICA. These comparisons revealed that posterior angle measurements permit a fairly good estimation of the curvature energy of the pICA, but no sufficient estimation of the pICA torsion energy. In summary, we provide objective definitions of the complexity of the pICA shape and evaluations of the significance of angle measurements of the posterior knee of the carotid siphon for estimating the pICA complexity.

Category: Poster

Title:Vascular micrometry of the parasellar internal carotid artery

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Poster was not presented.

Titel:Anatomic variations of the ostiomeatal complex elements

Authors: Scutariu M.(1),Baldea V.(2),Scutariu M.(3),Ciupilan C.(1),

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Abstract:

We propose reconsideration of the anatomic variation of the surgery points from the ostiomeatal complex structure and reevaluation of the diagnostic and therapy importance. The estimate are made in the context of the topographic endoscopic anatomy from nasal fossa.

Medical literature is full of anatomical and clinical studies (dissection, videorhinoscopy, computed tomography of the nasal cavity and paranasal sinuses) which are pointed out different modification of the anatomical structures at the normal limit: abnormality of size, insertion, anatomical and topographical relationship. There are mentioned anatomical variations which are interested in: uncinat process, hiatus semilunaris, ethmoidal infundibulum, ethmoidal bulla, frontonasal duct, Haller cells, middle meatum, Agger Nasi.

Category: Poster

Title: Anatomico-clinical considerations on the peripheral trigeminal branches in relation with the impacted wisdom molars, maxillary and mandibular

Authors: Ciuluvica R.C.(1), Rusu M.C.(1), Nimigean V.(2), Sirbu I.(3), Sandulescu M.(3),

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Poster was not presented.

Titel: The clinical anatomy of the maxillary sinus floor in the oral implantology

Authors: Nimigean V.R.(1), Nimigean V.(2), Rusu M.C.(3), Maru N.(2), Salavastru D.I.(2), Sarbu I.(4),

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Abstract:

Background: the upper limit in the oral implantology in the lateral maxillary area (LMA) is represented by the maxillary sinus floor (MSF). We determined the MSF position in relation to morphoclinical alveolodental benchmarks on 50 human adult cadavers, dentate (30) and edentulous (20), by dissections and on 20 patients using the 3D volumetric CT scans, in order to establish the quantity and quality of the available bone for the insertion of an endosseous implant. The results we obtained lead us to define 3 subantral classes at edentulous patients, emphasizing the direct relation of the age of the edentations and the degree of bone resorption. We discuss the results we obtained from the viewpoint of their application in the oral implantology.

Category: Poster

Titel:Root canal morphology of mandibular molars

Authors: Didilescu A.(1),Radocea O.(2),Stratul S.(3),Rusu D.(3),Iliescu R.(2),Iliescu A.(4),

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Abstract:

A knowledge of root canal morphology of mandibular molars and its frequent variations is a basic requirement for endodontic success.

Purpose: Following Vertucci's classification (1984), we studied the characteristics of 20 mandibular molars (first and second molars) extracted from Romanian patients.

Material and methods: The following items were recorded: number of roots, number of canals per root, presence of apical deltas, lateral canals and transverse anastomosis between canals. In order to visualize the internal root canal morphology, we used a tooth-clearing technique. Radiographs were taken in advance.

Results: all teeth presented 2 roots. Results for the distal canals: there was one molar with 2 distal canals. Fifteen percent showed apical deltas. The same percentage was found to present lateral canals in the apical third. Results for the mesial canals: Six teeth (30%) had the mesial canals fused in the middle third of the root, while five teeth (25%) had them fused in the apical third. Two teeth (10%) presented transverse anastomosis between canals in the middle third of the root. The results were compared with the radiographic findings. There was a major difference between these two methods, as the radiographic means did not allow us to detect the presented details.

Conclusions: From the clinicians point of view these variations may raise many problems. Fortunately, techniques as dynamic irrigations, gutta-percha condensation techniques and use of microscopic methods as complementary aids for root canal treatments, make it possible to overcome most of difficulties.

Category: Poster

Title:Anatomofunctional organization of tubal spine

Authors: Severin F, Puisoru M, Varlam H, Antohe I, Antohe D,

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No abstract available

Titel: The pterygopalatine fossa – an anatomical and imagistic study

Authors: Cergan R.(1), Soficaru A.D.(2), Miritoiu N.(3), Maru N.(4), Banu M.A.(1), Rusu M.C.(5),

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Abstract:

The pterygopalatine fossa is an area located deep in the skull base and various microsurgical and endoscopic procedures deal with it. The aim of the present study was to bring evidence on the anatomy and relationships of the pterygopalatine fossa. For the study we performed microdissections in 20 human adult specimens (lateral, anterior and superior approaches) and we analyzed morphologically and morphometrically the CT scans of 50 patients without any known pathology in the region we investigated. Also 30 dry skulls were used for measurements. Our analysis bring data relevant for clinicians on the pterygopalatine fossa shape and size, pterygoid (vidian) canal size and relations, greater palatine canal size, pterygomaxillary fissure size and distance from it to the zygomatic arch and the distance between the pterygopalatine fossa and the anterior wall of the maxillary fossa. Microdissections revealed the complex topography of the pterygopalatine fossa and its contents, the vascular contents being in a coronal plane, anterior to the neural contents. In conclusion, a correct understanding and knowledge of the anatomic structures lodged into the PPF, as well as their relationships and functions, remain crucial to minimizing postsurgical morbidity and intraoperative complications. Grant of the Romanian Academy, 145/2007.

Category: Poster

Titel: The jowl

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Abstract:

The Jowls

F. Anderhuber, U. Pils

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Purpose:

To get an explanation of the boundaries of the jowl compartment.

Methods: Subcutaneous injection of coloured gelatine both into the jowl compartment and different coloured gelatine into adjacent compartments.

Results: The spreading of the injection fluid was limited very distinctly to an area below the margin of the mandibula in the region of the submandibular gland. The content of the compartment was existing of fatty tissue. The ground of the compartment was the platysma muscle, the surrounding boundaries were consisting of fibrous structures. Commonly these structures are described as ligaments. The upper border on the cheek was the platysma-mandibular ligament, the anterior border on the submental compartment was the paramedian platysma retaining ligament. Posteriorly the compartment extended to the submandibular platysma retaining ligament.

Conclusion: The jowls appear in the aging face. On the one hand they are based on an accumulation of fat and on the other hand on the descending of the submandibular gland.

Category: Poster

Titel: The macroscopic morphology and topographic anatomy of the temporomandibular joint revisited

Authors: Podoleanu L.(1), Nimigean V.(2), Cergan R.(3), Banu M.A.(4), Rusu M.C.(1),

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Abstract:

The present study was designed to recall the topographic anatomy of the TMJ using evidence-based dissections. For the study dissections were performed in 20 human adult specimens, of both sexes; most of the specimens were fixed. We present here evidence for the morphological features of the TMJ, such as the basic articular components (i.e. the ligaments) and the lateral pterygoid muscle articular attachment. Also we present the topographic relations of the TMJ: (a) the posterior relations with the upper parotid pole and the neurovascular elements at that level, such as the auriculotemporal nerve, the facial nerve, the anastomosis of Cannieu – Riche and the superficial temporal vessels; (b) the lateral relations represented by sub-SMAS neurovascular elements (such as the facial nerve branches) and by the masseteric space contents; (c) the deep relations, represented by the retrocondilar buttonhole of Juvara and pterygoid space contents. All our results are intended to serve clinicians for a better understanding and management of the temporomandibular joint. Romanian Academy Grant 131/2007

Category: Poster

Titel:Palpable landmarks for identification of the facial nerve trunk in parotid gland surgery

Authors: Stroica L.(1),State D.(1),Diaconescu B.(1),Tarta-Arsene E.(1),Enyedi M.(1),Marinescu T.(1),Terteliu F.(1),

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Abstract:

Palpable landmarks for identification of the facial nerve trunk in parotid gland surgery

Laura Stroica, D.State, B.Diaconescu, E.Tarta-Arsene, M.Enyedi, T.Marinescu, F.Terteliu
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Introduction. In parotid gland surgery, external palpable landmarks for safe identification of facial nerve trunk are very useful.

Methods. We dissected 6 human cadaver heads in our department of anatomy. Then we designed on the facial skin a triangle formed by the temporomandibular joint, the angle of the mandible and the posterior margin of the mastoid process. We measured the distance between the centre of this triangle and the actual position of the facial trunk. The same procedures were performed by a maxillofacial surgeon during two orthograde parotidectomies.

Results. We identified the facial nerve trunk in 11 cases from the 12 hemifaces dissected. We compared the results obtained during the anatomical dissections with the intraoperative measurements.

Conclusions. These palpable landmarks may be of significant help during the surgery of the parotid gland, because they make the parotidectomy safer and more effective by preventing hyatrogenous nerve injuries.

Key words: parotid gland, surgery, facial nerve trunk, temporomandibular joint

Category: Poster

Title: Individual distinctions in blood supply of the extracranial part of the facial nerve

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Poster was not presented.

Title: Craniofacial morphometric measurements in Turkish children with beta-thalassemia major

Authors: Demirel B.(1),Yildirim F.(1),Ozsoy U.(1),Ozturk Z.(2),Arıcan R.(1),Sarıkcioglu L.(1),Keser I.(3),Yesilipek A.(2),Ozdem S.(4),Suzen B.(1),Oguz N.(1),

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Poster was not presented.

Titel:Method selection in craniofacial measurements: advantages and disadvantages of 3D computer-aided method

Authors: Ozsoy U.(1),Yildirim F.(1),demirel B.(1),Sarikcioglu L.(1),

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Abstract:

Purpose: Treatment of the craniofacial malformations is a primary goal of plastic and reconstructive surgeons. Surgical treatments of these malformations requires accuracy of the data. Accuracy of measurement should be a primary goal of scientists to prevent statistical errors and therefore to promote the comparison of the results obtained from research groups. In the present study we aimed to compare three different measurement techniques, which were used frequently in craniofacial measurements.

Methods: A total number of 25 female and 25 male volunteer adults were included to the study. Photographometric, 3D computer-aided and electronic caliper methods were used for the present study. Measurements were obtained from the ear, eye, nose, mouth, and cranium.

Results: In comparison of three methods, our findings revealed that 3D computer-aided method is an easy, robust, and sensitive method to compare the data.

Conclusions: The results showed that 3D computer-aided method is accurate, and it can be applied to both clinical practice and research. Advantages and disadvantages of three methods were discussed with the relevant literature.

Category: Poster

Titel:Cell-cycle proteins in benign and malignant thyroid entities

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Abstract:

Purpose: We studied the expression of different cell-cycle proteins in classical papillary thyroid carcinomas (nFVPTC), the follicular variant of papillary thyroid carcinoma (FVPTC), in hyperplastic papillary areas of hyperplastic nodules (HYP), and in non-malignant normal thyroid parenchyma (Pa). We searched for possible diagnostic relevant differences within these four groups.

Material 177 malignant thyroid carcinomas (114 FVPTC; 63 nFVPTC), 72 Pa and 18 HYP were investigated in this study.

Methods: The investigation was performed on Micro-tissue arrays after immunohistochemical detection of Ki67, Cyclin D1, RBGP-1 and p16 INK4a. Positive nuclear staining was counted in hot spots and documented in percentage values. Statistical analysis was performed in SPSS 13.0.

Results: Significant differences between malignant and benign samples were found for Cyclin D1 and p16 INK4a. Only the outcome for Ki67 showed a significant difference between nFVPTC and FVPTC.

Conclusion: Our results showed similar expression ratios for Cyclin D1, RBGP-1, but also for p16 INK4a, a protein involved in tumour suppression.

Category: Poster

Titel: The atrioventricular node artery

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Abstract:

The atrioventricular node artery (AVNA) is an important supplier of the atrioventricular part of the nodal conduction system and an important element for the pathogenesis of the cardiac blocks. In 30 adult human hearts we performed microdissections to investigate the AVNA. Topographically this artery could be defined as superior (SAVNA) if emerged from the right anterior atrial branch of the right coronary artery, posterior (PAVNA) if emerged at crux cordis or anterior (AAVNA) if emerged from the anterior descending septal branch of the anterior interventricular artery. The PAVNA left either the right (D-type) or the left (S-type) coronary artery at crux cordis; there were several subtypes for the D-type, that we numbered from I to V. The DI subtype (PAVNA from the left retroventricular artery) was the most frequently encountered (48%) and in a specimen it came with a doubled PAVNA. These findings can justify different arrhythmic pictures in patients with comparable coronary occlusion levels. Romanian Academy Grant 130/2007

Category: Poster

Title: The septal arteries – a morphological study

Authors: Petrescu C.(1),Cebzan C.(1),Sisu A.(1),Niculescu V.(1),Niculescu M.C.(1),Matusz P.(1),Rusu M.C.(2),

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Poster was not presented.

Title: Arterial blood supply of the sinoatrial and atrioventricular nodules

Authors: Filipoiu F.(1),Enyedi M.(1),Tarta-Arsene E.(1),Marinescu T.(1),Badoiu S.(1),Tulin A.(1),Tulin R.(1),

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Poster was not presented.

Title: The left papillary muscles – microscopical angioarchitecture

Authors: Petrescu C.(1),Cebzan C.(1),Sisu A.(1),Niculescu M.(1),Niculescu V.(1),Matusz P.(1),Rusu M.C.(2),

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Poster was not presented.

Title: Anatomic-radiologic and morphometric considerations on the left coronary artery

Authors: Paduraru D.(1), ZAMFIR M.(2), PADURARU L.(3), ZAMFIR C.(4), INDREI A.(4), STOICA L.(5), NEGRU D.(4),

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Poster was not presented.

Titel: Age-related changes of intrinsic cardiac nerves in rats and guinea pigs. A light microscopic study

Authors: Pauziene N.(1), Rysevaite K.(1), Pauza D.(2),

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Abstract:

Purpose: The aim of the present study was to determine the age-related morphological changes of the intrinsic cardiac nerves in rats and guinea pigs as the autonomic cardiac function undergoes substantial changes during aging.

Methods: The study was performed on 146 nerve samples from both sexes of adult rats (n = 5) and guinea pigs (n = 5), as well on 137 nerve samples from old rats (n = 5) and guinea pigs (n = 5). Morphometric analysis was performed on resin embedded semithin transverse sections of the intrinsic cardiac nerves.

Results: The present findings showed that the mean cross-sectional area in the rat and intrinsic cardiac nerves decreased ($p < 0.05$) with age up to $42 \pm 0.8\%$ and in the guinea pig – $51 \pm 1.2\%$. The density of myelinated fibers and Schwann cell's nuclei in the intrinsic cardiac nerves of the rats decreased with age. The density of myelinated fibers and Schwann cell's nuclei in the intrinsic cardiac nerves of the guinea pig increased ($p < 0.05$) with age. No statistical significance was observed between the densities of intrinsic cardiac nerve capillaries in the adult and old animals. The perineurial thickness did not change with age in the rat intrinsic cardiac nerves but it became thinner in nerves of the guinea pig heart.

Conclusions: The discovered age related morphologic changes of the intrinsic cardiac nerves may substantially influence the normal nerve physiology and, therefore, the age-dependent differences should be taken into consideration during data assessment in many kinds of experiments.

Category: Poster

Titel: Epicardial neural plexus of the ovine heart

Authors: Pauza D.(1), Saburkina I.(1), Rysevaite K.(1), Pauziene N.(2), Vaitkevicius R.(1),

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Abstract:

Purpose: To determine the morphologic pattern of the epicardial neural plexus (ENP) on total (non-sectioned) ovine hearts in order to assess its correspondence to the ENP in humans.

Methods: Intrinsic cardiac neural plexus was revealed by a histochemical method for acetylcholinesterase on whole hearts of 4 sheep and 1 newborn lamb with their subsequent stereomicroscopic examination.

Results: Mediastinal nerves accessing the ovine heart through venous part of the heart hilum proceeded separately into innervation regions by five epicardial ganglionated subplexuses, while nerves passing the arterial part of heart hilum formed two subplexuses, topography of which were corresponding to their topography in humans. The highest density of epicardial ganglia was determined in the left dorsal and the dorsal right atrial subplexuses, which involved correspondingly 48 % and 23 % of the all ganglia counted within the ovine epicardium. The largest in cumulative area ganglia were concentrated near sinoatrial node on the root of the right cranial vein (RRCV) and in the ventral superior right atrial region. The mean cumulative area of epicardial ganglia distributed on the RRCV was 2,25 mm² in a lamb and 6,24 mm² in adult sheep. The mean cumulative area of epicardial ganglia on the ventral superior right atrial region was 1,38 mm² in a lamb and 3,23 mm² – in adult sheep hearts.

Conclusion: The richest in ganglia sites on the ovine epicardium are concentrated at the RRCV and this is in sharp contrast to the human ENP, in which the majority of ganglia are located on the dorsal surface of the left atrium.

Category: Poster

Titel: Clinical anatomy of thoracic sympathetic chain

Authors: Kuzmichev V.(1), Dydykin S.(2), Bogoyavlenskaya T.(3), Shmelyov A.(2),

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Poster was not presented.

Titel:Particularities of origin of the caudate branches from the anterior branch of the portal hepatic vein

Authors: NICULESCU V.(1),HORDOVAN E.(2),MATUSZ P.(1),

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Poster was not presented.

Titel:Analysis of the external morphology of liver's visceral aspect at the level of caudate lobe

Authors:MATUSZ P.(1),HORDOVAN E.(1),PUSZTAI A.(1),

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Abstract:

Purpose: To analyze the morphological variants of reliefs at the level of the visceral aspect of caudate lobe (CL), in order to correlate them with intraparenchymal vasculo-ductal elements.

Method: We analyzed the quantitative development of liver's visceral aspect of CL relief on a study material represented by 100 hepatic casts (50 fixed and 50 immediately after injecting the vasculo-ductal systems). The parenchyma of the casts injected with Technovit 7143 was corroded with hydrochloric acid after examination, in order to analyze the intraparenchymal vasculo-ductal elements.

Results: In 15% of the studied casts we noticed a particularly large development of the caudate process that markedly interrupts the continuity of the right sagittal sulcus realizing a parenchymal bridge to the right hepatic lobe. In 47% cases we noticed an important quantitative development of the papillary process, representing the predominant relief of the CL. The simultaneous major quantitative development of both processes was noticed only in 14% cases. In 7% cases the relief of the papillary process was replaced with a slightly concave surface of the visceral aspect of the CL. In 68% cases we noticed an ascendant sulcus between the caudate and the papillary process, in the middle part of the visceral aspect of the CL. The sulcus becomes more obvious on the casts with injected vasculo-ductal systems.

Conclusions: The correlation of CL relief with the intraparenchymal vasculo-ductal elements suggests the role of the caudate branches of the portal hepatic vein in realizing the projection relief of the CL (Supported by CNMP 4.1-092/2007).

Category: Poster

Titel:Associations of major anatomical variants of the elements of liver's afferent pedicle.
Study on corrosion casts

Authors: NICULESCU M.(1),HORDOVAN E.(1),JIANU A.(1),STANA L.(1),SZTIKA
D.(1),MATUSZ P.(1),

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Poster was not presented.

Title: Morphological considerations regarding the biliary confluents. Study on corrosion casts

Authors: Varlam H, Pop E,

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Poster was not presented.

Titel:Evaluation of pancreatic duct anatomy for improvement of surgical technique in pancreas surgery

Authors: Schlegel N.(1),Range P.(2),Timm S.(3),Steger U.(3),

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Abstract:

The pancreatic anastomosis after partial duodenopancreatectomy is still the critical point in pancreas surgery. Independent of the surgical technique, the formation of fistula is common, which is likely due to transverse cut branches of the pancreatic duct. To overcome this problem, exact knowledge on the anatomy of the pancreatic duct system would be informative. This could help to better define a resection line with a reduced number of transverse cut pancreatic duct branches. Therefore, in the present study, we investigated the pancreas duct anatomy in 15 human pancreatica of body donors from the anatomical dissection course. Pancreatic ducts were injected with contrast agent and computertomography was used to visualize the pancreatic duct system in detail. Histological analyses served to document the state of pancreas at the time of death. At the level of the portal vein, which is commonly used as the resection line, 0 to 6 (median 2) side branches of the pancreatic duct with a size of 0.5- 1.0 mm could be detected. Interestingly, in addition to the major pancreatic duct (Wirsungianus) and the accessory pancreatic duct (Santorini), we observed an additional accessory duct in 20% of the cases. This second accessory duct originated within the pancreas corpus from the major pancreatic duct and ran parallel to it. In conclusion, there appears to be no advantage in a shift of the resection line more right or left to the portal vein. However, a higher number of pancreatica will be investigated to address this important question in more detail.

Category: Poster

Titel: Considerations on the arterial supply to the pancreatic head

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Poster was not presented.

Titel:Cytokeratins, Mucins, and CDX-2 in primary mucinous appendiceal, ovarian, and secondary peritoneal neoplasms

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Abstract:

Aims: In this study we investigated the distribution of CDX-2 (a homeobox gene encoding an intestine-specific transcription factor) and a panel of other proteins: cytokeratins (CK 7 and CK 20), mucins (MUC 1, MUC 2, and MUC 5ac) in peritoneal implants deriving from appendiceal- and ovarian mucinous tumours, as well as in their primary sites. In addition, we evaluated the same panel of the proteins in primary tumours without peritoneal implants.

Methods and Results: We evaluate the panel of the same proteins in 16 mucinous tumors of the appendix, 21 of the ovaries, three cases of synchronic mucinous tumours of the appendix and the ovaries and in 15 cases their peritoneal implants.

In primary mucinous tumours of the appendix and their peritoneal implants CK 20, MUC 2, and CDX-2 were expressed.

In ovarian mucinous tumours without peritoneal implants only single cases showed CK 20, MUC 2 or CDX-2, but in cases with peritoneal implants all cases were positive for CDX-2 and MUC 2. In their peritoneal implants the majority were positive for MUC 2, CK 20, CK 7, and CDX 2.

Conclusions: Our results show that ovarian mucinous pathologies expressing CK 20, MUC 2 and CDX-2 are more likely associated with pseudomyxoma peritonei.

CDX-2 is of limited value for differentiating ovarian from appendiceal mucinous tumours. However, absence of CDX-2, MUC 2, and CK 20 excludes the appendix vermiformis as the primary site.

Category: Poster

Titel:Celiac Trunk-Anatomical Variants

Authors: Ispas T.(1),Constantinescu S.(2),Paduraru D.(2),Tarta E.(1),

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Poster was not presented.

Titel:Superior Mesenteric Artery-Anatomical Variants

Authors: Ispas T.(1),Paduraru D.(2),Constantinescu S.(2),Ene M.(1),Terteliu F.(1),

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Poster was not presented.

Titel: The arterial arcade of the ilio-pelvic colon – morphological typology

Authors: STANA L.(1),NICULESCU V.(1),MATUSZ P.(1),NICULESCU M.(1),JIANU A.(1),DAESCU E.(1),CIOBANU I.(1),BOSCU A.(1),

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Abstract:

The Inferior left colic artery corresponds to the ileo-pelvic colon, it is short and it divides into the superior, middle and inferior sigmoid arteries. Sometimes they present a bunch-like emergence from a common trunk originated from the inferior mesenteric artery, other times this trunk bifurcates and the resulting branches divide. The study has been performed on 100 corpses provided from the dissection halls. We applied the method of macroscopic dissection combined with the injection of plastic material in the blood vessels. If there are two sigmoid arteries, they have a direct origin from the inferior mesenteric artery or they form a common trunk with the left middle colic artery, after which they emerge as a bunch. Most frequently we observed the presence of three sigmoid arteries that emerge from a unique, common trunk, from which the first sigmoid artery emerges directly, while the other two derive from a secondary trunk, or the three sigmoid arteries can present a bunch-like emergence. If there are four arteries, they emerge as follows: the first, the first two, or the first and the fourth sigmoid artery directly from the inferior mesenteric artery, while the rest emerge through two or three common and solitary trunks. Exceptionally, we found five or six sigmoid arteries, where the first two presented a common trunk origin, the following ones had a common trunk and bunch-like ramifications and the sixth sigmoid artery originated directly from the inferior mesenteric artery.

Category: Poster

Titel: The arterial arcade of the ascending colon – constitutive aspects

Authors: Ciobanu I.(1), Niculescu M.C.(1), Niculescu V.(1), Zahoi D.(1), Rusu M.C.(2), Jianu A.(1), Daescu E.(1), Stana L.(1),

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Abstract:

The colic branches of the superior mesenteric artery are represented by the right colic arteries: superior, middle and inferior and the colon transverse artery. We used the method of macroscopic dissection (100 corpses) and the injection of the blood vessels with plastic materials. The types are: arcade for the right colic arteries, superior and inferior; arcade for the right colic arteries superior and inferior, divided in proximity; arcade for the three right colic arteries, the middle one having its origin in a common trunk with the inferior one; arcade for the three right colic arteries, the middle and the superior together through a common trunk; arcade for the right colic superior and middle, the superior and the middle having the same origin, arcade for the three right colic arteries, the first two coming through a common trunk with the middle one; arcade for the right inferior and middle colic arteries, the colon transverse territory till the joint with the right superior colic artery; arcade for the right colic inferior and middle, the colon transverse territory till the joint with the middle; arcade for the three right colic arteries, the middle one divided; arcade for the three right colic arteries, superior divided; arcade for the three right colic arteries, inferior divided; arcade for the right colic superior and inferior, the superior coming from mesenteric inferior; arcade for colic right inferior divided and middle colic, the territory till colon transverse, without right superior colic.

Category: Poster

Titel: The arterial arcade of the transverse colon – morphological variability

Authors: Niculescu M.C.(1), Niculescu V.(1), Daescu E.(1), Jianu A.(1), Stana L.(1), Ciobanu I.(1), Rusu M.C.(2), Petrescu C.I.(1),

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Abstract:

The vascularization of the transverse colon is ensured by the anastomosis of the right superior colic artery with the inferior left colic artery. The middle side of the arterial arcade of the transverse colon is sometimes approached by an inconstant arterial branch, the median colic artery. The study has been realized on a batch of 100 corpses through macroscopical dissection method and injecting the vessels with plastic materials. The results of the study showed 3 ways of the arterial arcade of transverse colon: simple, double and triple. Simple - 64 % of the cases made of the superior right colic artery and superior left colic artery. Double - 34% of the cases, determined by the existence of the median colic artery. Triple - 2% of the cases - its presence is related to the existence of middle early bifurcation fork colic artery. Among the 3 constitutive possibilities of arterial arcade of the transverse colon, other 20 morphological aspects can be seen. In 64 % of the cases, the arterial arcade of the transverse colon is made of 2 main branches: the right branch formed of the superior right colic artery and seldom of middle right colic artery; and left branch, always represented by the left superior colic artery. In 36 % of the cases the arterial arcade of the transversal colon is made of 3 branches: right, left and middle. The lateral right and left branches are formed of the superior right colic artery and the left superior colic artery; the middle branch is formed by the middle colic artery.

Category: Poster

Titel: The arterial arcade of the descending colon – constitutive types

Authors: Jianu A.(1), Niculescu M.C.(1), Niculescu V.(1), Ciobanu I.(1), Daescu E.(1), Stana L.(1), Rusu M.C.(2), Sisu A.(1),

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Abstract:

The vascularization of the colon is ensured by the superior mesenteric artery and also by inferior mesenteric artery. Generally, there are two colic branches of the inferior mesenteric artery: left superior colic artery and left inferior colic artery, but extremely rare there are three branches, the third being the left middle colic artery, branch of left superior artery. For this study we used the macroscopic dissection and the injection of the blood vessels with plastic materials applied to 100 corpses. The constitutional types are: arcade for the left colic, superior and inferior; superior and inferior, where the first one is divided in two; superior and inferior, where the last one is divided in two; superior and inferior, where both of them are divided; arcade for the left superior, middle and inferior, where the middle one is divided; arcade for the left superior and inferior, where the first one comes from inferior mesenteric artery; arcade for the left superior, middle and inferior, where the first and the second come from a common trunk; arcade for the left superior, middle and inferior, where the second and the last come from a common trunk; arcade for the left superior, middle, accessory middle and inferior, the first two artery having the same origin in a common trunk and the last two also in a common trunk. The study showed us that paracolic artery arcade of the descendent colon is constantly formed by left superior and inferior colic artery and variably by left middle colic artery.

Category: Poster

Titel:Microscopical study of adult celiac ganglia

Authors: Sisu A.(1),Petrescu C.I.(1),Niculescu V.(1),Cebzan C.(1),Niculescu M.(1),Rusu M.C.(2),

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Abstract:

The constitutive neurons of adult celiac ganglia have different cells size and a multipolar aspect. Neuronal grouping was made at the local dendrite plexus level, well represented, formed by a network of dendrite cells prolonged, occupying the same microscopic area. Morphological aspect of serial chaining can be suggestive for interneuron's presence and for pre ganglia stimuli multisynaptic transmission, received at neurons group level. Dendrite number and length is directly correlated with the axe-dendrite and dendrite-dendrite contacts possibility. Unlike interneuron's groups, the main neurons are grouping and formed dendrite glomeruli. Celiac neurons have big size and an aspect multipolar by excellence. At its level cytoplasm shows strongly argirophile and the nucleus is adopting an exocentric cell disposer. Neurons of the celiac ganglia level are big cells, which, according with the dendrites morphology, are systematized as follow: neurons with short and fine dendrites-relative rarely; neurons with short and thick dendrites; neurons with long, fine or thick dendrites. Dendrite glomerulus's can be simple, allocated to one cell, or composed (double cells, triple cells or multi cells). The sympathetic neurons of the celiac ganglia level and the mesenteric ganglia level innervated the mesenteric vessels, regulating the activities of the gastrointestinal tract. These ganglia are represented by complex neural networks, with the capacity of integration of the efferent and sensitive information, and coordinating the peripheral activities.

Category: Poster

Titel: Study of the celiac ganglia development

Authors: Sisu A.(1), Petrescu C.I.(1), Niculescu V.(1), Cebzan C.(1), Niculescu M.(1), Rusu M.C.(2),

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Abstract:

The celiac ganglia and the visceral plexus are complex structures, disposed in the proximity of the main collateral branches of the aorta. Pre visceral ganglia are sympathetic ganglia chains between the lateral vertebral sympathetic chain and viscera. Our study is made in the anatomy lab on 30 adult human bodies, one of new born and 10 human fetal specimens with crown-rump lengths from 9 to 28 cm. It was used the argental impregnation by Bielschowsky on block and trichrome Masson methods for microscopic evidence.

Prenatal, celiac ganglia are not a good defined morphological unit.

At 13 weeks the celiac ganglia is not configured macroscopically or mezoscopically. Locally is observed the presence of nerve cells elements with neuroblastic characters that legitimize two characters: (a) by grouping; (b) by dispersion and migration. They show a delay of neuroblastic maturation, comparing with the par vertebral ganglia. At the 20 cm crown-rump length fetus (5 month of pregnancy) the celiac population is morphologic determined not macroscopic or mezoscopic but microscopically. The pat gnomonic population on the celiac triangle origin side, at the posterior vagal trunk bifurcation level, shows certain elements of lama diagnostic. The nervous functional unit is represented by the neuron. At 5 month the celiac ganglia is cytological polymorph and homogenous. The ontogenesis of the celiac ganglia follows several stages. Then, the neuronal specialization and the functional neuronal maturation are processes based on the numeric and morphological remodeling of the neuronal connecting figure, pre ganglia and post ganglia.

Category: Poster

Titel:Surgical importance of the origin of the inferior polar renal artery

Authors: Sapte E.(1),Bordei P.(1),Indrei A.(2),

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Poster was not presented.

Titel:A case with multiple anomalies in the upper limb

Authors: Ozturk A.(1),Arıcan R.(1),Coskun N.(1),Sarıkcioglu L.(1),Sindel M.(1),

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Poster was not presented.

Titel:Correlation between subchondral bone density and thickness of hayline cartilage in the canine shoulder and elbow joint

Authors: Maierl J.(1),Winhard F.(1),Böttcher P.(2),Liebich H.(1),

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Abstract:

Introduction: It was the objective of this study to investigate a possible correlation between the thickness of the hyaline articular cartilage and the subchondral bone density.

Methods: A total of 8 shoulder joints and 12 elbow joints from orthopaedically healthy dogs with an average body weight of 33.5 kg were used. All joint specimens were scanned by computed tomography and the subchondral bone density was determined according to the CT-osteabsorptiometry. Subsequently all specimens were sectioned into slices (2 mm) and cartilage thickness was determined in predefined measuring points. The values of the cartilage thickness were correlated statistically with the respective values of the subchondral bone density.

Results: The cartilage thickness in the glenoid of the scapula varied between 0.22-1.2 mm. In the humeral head cartilage thickness was found to vary between 0.15-1.3 mm. The coefficient of correlation between cartilage thickness and subchondral bone density were $r = -0.4$ for the scapula and -0.51 for the humeral head.

In the humeral condyle the thickness of articular cartilage varied between 0.23-0.66 mm. Cartilage thickness in the radial head was found to be 0.3-0.5 mm. In the ulnar notch the respective values were 0.15-0.72 mm.

Subchondral bone density and articular cartilage thickness showed no statistically significant correlation in the elbow joint (r varied between 0.01 and 0.2 for the single articular surfaces).

Discussion: The original hypothesis that there exists a correlation between the parameters cartilage thickness and the subchondral bone density had to be rejected.

Category: Poster

Titel:Chronobiological analysis of ulna joint at representatives of Canidae

Authors: Slesarenko N.(1),Mishchenko S.(1),Kapustin R.(2),

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Poster was not presented.

Titel:Os acromiale: two different case reports

Authors: Coskun N.(1),Cengiz M.(1),Karaali K.(2),Cevikol C.(2),Sindel M.(1),

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Abstract:

Purpose; Os acromiale is a rare anatomical condition. It presents when the anterior portion of the acromion has one or more separate ossicles. Macalister provided a precise description of the formation of the acromial epiphysis. Several ossification points fuse to form 3 major elements. The anterior element is the preacromion, the middle one is the mesoacromion, and the posterior element which forms the acromial angle, is the metaacromion. Os acromiale associated with the subacromial pathology have been cited to imply that this entity is a cause of subacromial impingement. So we aimed in this study to determine the anatomical and radiological incidence of os acromiale in Turkish subjects.

Material Methods; For the radiological evaluation, the posterior-anterior and the lateral shoulder radiographs of 90 consecutive adult patients with normal findings were used. Additionally 90 dry scapula bones were randomly selected at the anatomy laboratory of our faculty.

Results; In the shoulder radiographs, the os acromiale was observed in one patient aged 37 years. Location of the os acromiale was pre-acromion. Os acromiale was observed only in one dry bone, which was located as meta-acromion.

Conclusion;The incidence was between 1-15 % in the available literature and the presence of os acromiale was 1% in shoulder radiographs and anatomic evaluation in the present study.

Category: Poster

Titel: The incidence of accessory navicular bones in Turkish subjects

Authors: Coskun N.(1), Utuk A.(1), Sindel T.(2), Bircan O.(2), Ozdemir H.(3), Sindel M.(1),

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Abstract:

Purpose; Ossa accessoria are the skeletal variations of the ankle and foot. The accessory navicular, also known as os tibiale, os tibiale externum and naviculare secundarium is adjacent to the posteromedial tuberosity of the navicular bone in 4-21% of individuals. Some authors had declared the marked association of accessory navicular with flat-foot deformity. It may exist adjacent to the main bone or separated and may cause various diseases at foot and mimic fractures of foot bones. Therefore, they are often confused with avulsion fractures.

Material Methods; For the radiological evaluation, the posterior-anterior foot radiographs of 600 consecutive adult patients were used. Additionally 50 dry navicular bones were randomly selected at the anatomy laboratory of our faculty.

Results; In our study, accessory navicular bones (11,6%), was observed and Type I, II, III was determined. Accessory navicular bones was seen in 39 % of all male participants and 22,2 % of all female participants.

Conclusions; we aimed to document anatomical, radiological and orthopedic incidence investigation types of accessory navicular bones of Turkish subjects in both extremities according to sex, frequencies, divisions, coexistence and bilaterally.

Category: Poster

Titel: The rate of successful intra-articular puncture of finger joints subject to position of puncture and physician's experience.

Authors: Pichler W.(1), Weinberg A.(2), Tesch N.(3), Clement H.(1), Grechenig W.(1),

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Poster was not presented.

Titel: Calcifications in the tendon of external rotators of the humerus

Authors: Gogulescu B.(1), Gogulescu N.(2), Popa C.(3), Gogulescu B.(1), Popa C.(3), Gogulescu N.(2),

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Abstract:

The lesions caused by overworking the locomotor system are the effect of microtraumatism, the corresponding term is „over use” from the anglo-saxons and these lesions are the consequence of some gestures specific for each sport, these gestures are made with a great amplitude, at the limit of the physiological movements, with great speed and violent forces. Repeating these gestures can lead to minor, but constant and continuous traumatism on different structures of the locomotor system: bones, joints, muscular – tendinous chains, blood vessels, nerves.

Category: Poster

Titel: The subacromial impingement syndrome

Authors: Gogulescu B.(1), Gogulescu B.(1), Gogulescu N.(2), Popa C.(3), Rosnitche A.(4), Stefan A.(4),

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Abstract:

Joint impingement is a painful syndrome caused by the friction of joint tissues, which is both the cause and the effect of altered joint biomechanics.

The subacromial impingement syndrome describes the pathological contact between the rotatory cuff and the acromion. The mechanism was a compressive force on the supraspinatus tendon rather than the tensile force common to rotator cuff lesions.

When conservative treatment of subacromial impingement syndrome (S.I.S.) fails, a subacromial decompression is warranted.

Category: Poster

Titel: The instability of the anterior part of the shoulder

Authors: Gogulescu B.(1), Gogulescu N.(2), Gogulescu N.(2), Gogulescu N.(2), Gogulescu B.(1), Gogulescu B.(1),

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Abstract:

The anatomic organization of the shoulder joint confers it a great mobility, but in the same time exposes it to dislocations and instability. The study of the anatomic structures allows us to understand the physiopathological mechanisms of the instability, the way they produce, the lesions that we find. The evolutive profile allows us to establish, classify and isolate the particular clinical forms.

The contribution of the scapula in the movements of the shoulder is essential for the normal function of the shoulder. When one develops a strategy of rehabilitation of the shoulder one should use the plurimeter V which is used for the measurement of the scapula rotation movement towers up during the elevation of the humerus in coronal abduction.

Category: Poster

Titel:Consequence of stress on the shoulder

Authors: Gogulescu B.(1),Gogulescu N.(2),Popa C.(3),Rosnitche A.(4),

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Abstract:

The shoulder is the most mobile and unstable joint of the human body. The main role of the shoulder(arm, elbow, forearm and fist) is to place in a good position in order to accomplish its functions. The shoulder joint is particularly vulnerable because the over head activities stress the static stabilizers and the dinamic ones.

The subacromial impingement sindrom designates the pathological contact between the rottator cuff and the acromion. The term, in conjunction with the understanding of pathological causes needs therapeutic and prognostication clear up.

The author applies an 1% xilin injection into the subacromial-subdeltoidian space in diagnostic purpose (Neer test) and cortison preparation (dexametason) in therapeutic purpose.

Category: Poster

Titel:Superficial ulnar artery: A case report

Authors: State D.(1),Stroica L.(1),Lupu G.(1),Cristea B.(1),

Addresses:(1)Anatomy|"Carol Davila"University of Medicine and Pharmacy, Faculty of Medicine|Bucharest|Romania

Abstract:

The superficial ulnar artery is the ulnar artery that lies superficially in the forearm. During a dissection procedure in our department of anatomy, we observed a superficial ulnar artery in a 67-year-old female human cadaver. It originated from the brachial artery 1-2 cm above the bend of the elbow. In the cubital fossa, it passes superficially over the antebrachial fascia, on the ulnar side of the forearm. It passes superficially to the pronator teres, flexor carpi radialis and flexor digitorum superficialis muscles. After the origin of superficial ulnar artery, the brachial artery gives off the radial and common interosseous arteries. In the hand the superficial ulnar artery anastomosed with the superficial palmar branch of the radial artery, creating the superficial palmar arch. The normal ulnar artery was absent. The existence of superficial ulnar artery is of great interest to the clinician as well as to the surgeon. The artery may be mistaken for a vein and may be injured. In cases as that reported by us, the accidental injury of the superficial ulnar artery during surgical procedures can result in severe ischaemia of the forearm.

Key words: superficial ulnar artery, common interosseous artery, radial artery, ischaemia, forearm

Category: Poster

Titel: Superficial palmar arch: an arterial diameter study

Authors: Marinescu T.(1), Filipoiu F.(1), Tarta E.(1), Enyedi M.(1), Tulin A.(1), Tulin R.(1),

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Abstract:

Although the anatomic variations of the superficial palmar arch have been a subject of study, studies about the diameters of the palmar arch are quite rare. Our study consists of dissecting and analyzing forty hands, twenty right hands and twenty left hands. We measured each arch in three different places. In case of a complete arterial arch the ulnar artery's diameter was larger, but for an incomplete arterial arch the radial artery was larger than the ulnar artery.

Category: Poster

Titel:Superficial ulnar artery: A case report

Authors: State D.(1),Stroica L.(1),Lupu G.(1),Cristea B.(1),

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Abstract:

Superficial ulnar artery: A case report

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The superficial ulnar artery is the ulnar artery that lies superficially in the forearm. During a dissection procedure in our department of anatomy, we observed a superficial ulnar artery in a 67-year-old female human cadaver. It originated from the brachial artery 1-2 cm above the bend of the elbow. In the cubital fossa, it passes superficially over the antebrachial fascia, on the ulnar side of the forearm. It passes superficially to the pronator teres, flexor carpi radialis and flexor digitorum superficialis muscles. After the origin of superficial ulnar artery, the brachial artery gives off the radial and common interosseous arteries. In the hand the superficial ulnar artery anastomosed with the superficial palmar branch of the radial artery, creating the superficial palmar arch. The normal ulnar artery was absent. The existence of superficial ulnar artery is of great interest to the clinician as well as to the surgeon. The artery may be mistaken for a vein and may be injured. In cases as that reported by us, the accidental injury of the superficial ulnar artery during surgical procedures can result in severe ischaemia of the forearm.

Key words: superficial ulnar artery, common interosseous artery, radial artery, ischaemia, forearm

Category: Poster

Titel: The relationship between femur curve and anatomical axis: A pilot study

Authors: Donmez B.(1), Ozsoy U.(2), Demirel B.(2), Urguden M.(3),

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Abstract:

Purpose: During surgical procedures of the femur, it is important to know degree of the shaft of the femur in order to avoid iatrogenic femoral penetration. So that we aimed to digitally measure the shaft curve of femur according to anatomical axis

Methods: The shaft curve of the femur was measured according to anatomical axis of femur using MicroScribe G2X digitizer and the data were obtained by Surfcam Velocity software.

Results: In the present study, thirty femurs were measured. The femurs were distinguished as left and right. Obtained data was statistically analyzed. The mean value of the curve of the femur shaft was $15,25 \pm 3,06$ degrees for left and $16,22 \pm 2,40$ degrees for right, respectively.

Conclusion: We think that the degree of the curve of the femur shaft should be kept in mind during surgical procedures.

Category: Poster

Titel: Digital measurements for femoral prosthesis: A pilot study

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Abstract:

Purpose: To measure the angle between the anatomical axis and the plane pass through the center of femur condyles.

Methods: Angle between anatomical axis and the plane pass through the center of femur condyle was measured using MicroScribe G2X digitizer and the data were obtained by Surfcam Velocity software.

Results: In the present study, thirty femurs were measured. The femurs were distinguished as left and right. Obtained data was statistically analyzed. The mean value between the anatomical axis and the plane pass through the center of femur condyles $86,51 \pm 2,00$ degrees for left and $86,51 \pm 2,51$ degrees for right femurs. The other measurement was the mean value of angle between anatomical and mechanical axis. It was $7,53 \pm 0,56$ degrees for left and $7,00 \pm 0,76$ degrees for right femurs, respectively.

Conclusion: Anatomical and mechanical axis of femur is important for femoral prosthesis. We think that anatomical and mechanical axis should be kept in mind during reconstructive surgical procedures.

Category: Poster

Titel: The neurovascular bundle of the extensor compartment of leg in relation to treatment of tibia fractures with the Less invasive Stabilisation System

Authors: Tesch N.(1), Grechenig W.(2), Pichler W.(2), Clement H.(3),

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Poster was not presented.

Titel: Bone mineral density and muscle strength of the foot in elite ballet dancers

Authors: Coskun N.(1), Arican RY(1), Melikolu M.(2), Kacar C.(3), Erkilic M.(4), Bircan O.(5), Sindel M.(1),

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Poster was not presented.

Titel:Anatomic-clinical study concerning the cruciate ligaments lesions incidence in the knee joint

Authors: PURECA A.(1),PETRESCU C.(1),CEBZAN C.(1),SISU A.(1),NICULESCU M.(1),NICULESCU V.(1),MATUSZ P.(1),

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Poster was not presented.

Titel: Pattern of patellar cartilage loss in OA patients with neutral, valgus, and varus knee alignment

Authors: Kunz M.(1), Cahue S.(2), Marshall M.(2), Wirth W.(3), Hudelmaier M.(1), Sharma L.(2), Eckstein F.(1),

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Abstract:

Purpose: The relationship between malalignment of the knee and progression of osteoarthritis (OA) in the femoropatellar joint has not been established. Here we investigate the magnitude and regional pattern of patellar cartilage loss in a community-recruited cohort of participants with neutral, valgus and varus knee alignment,

Methods: 181 persons from the community with radiographic femorotibial OA (age 66 ± 11 years) had alignment measured by full limb x-ray. 78 subjects had neutral, 58 varus and 45 valgus alignment. An axial FLASH MRI sequence was acquired at baseline and 26.7 ± 2.6 months later. Segmentation was performed by tracing the total subchondral bone (tAB) and cartilage surface area (AC) of the patella. Changes in cartilage volume and thickness were computed for the entire patella and for patellar subregions (medial and lateral patellar facet).

Results: Across all participants, the annual patellar cartilage volume loss was $1.8 \pm 3.2\%$ ($p < 0.0001$). Participants with varus malalignment ($-1.5 \pm 2.5\%$) and valgus malalignment ($-1.7 \pm 3.4\%$) did not display a higher rate of cartilage loss than those with a neutral knee axis ($-2.1 \pm 3.7\%$). The reduction in the medial and lateral patellar facet was of similar magnitude and the ratio of medial versus lateral cartilage loss did not differ between participants with neutral, valgus and varus alignment.

Conclusions: Significant cartilage loss occurs in the patella of persons with femorotibial OA, but varus and valgus malalignment appear to have no effect on the regional pattern of cartilage loss in the patella.

Category: Poster

Titel: How does choice of computational algorithm and femoral region of interest affect reproducibility?

Authors: Hudelmaier M.(1),Wirth W.(1),Charles C.(2),Kraus V.(3),Wyman B.(4),Hellio Le Graverand-Gastineau M.(4),Eckstein F.(1),

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Abstract:

PURPOSE: To investigate: 1) how various cartilage thickness computations (minimal distance from the cartilage surface (AC) to the bone interface (tAB), minimal distance from the tAB to the AC, or the average of both) affect reproducibility? 2) How does choice of shorter or longer ROIs of the weight-bearing femoral condyle, affect reproducibility?

METHODS: 1.5mm coronal FLASHwe MR Images were acquired in 30 females using a Siemens Magnetom 1.5T. The tibial (MT/LT) and femoral (cMF/cLF) cartilages were analyzed. Femoral ROIs were defined as: between the intercondylar notch anteriorly and the intercondylar bone bridge posteriorly (short ROI), and between the intercondylar notch and 60% of the distance to the posterior end of the femoral condyle (long ROI). Cartilage thickness was computed as minimal distance from AC to tAB and vice versa.

RESULTS: In the long ROI, the tAB of femoral cartilages was 25% (cMF) and 26% (cLF) larger than in the short ROI. The variability for the size of the ROI was 25% smaller using the long ROI. Computation of the mean thickness (ThCtAB.Me) was more reproducible than that of cartilage volume (VC), but no difference was observed between various implementations for thickness. Reproducibility of thickness computations in the medial condyle was slightly higher using the long ROI, while being similar in the lateral condyle for both ROIs.

CONCLUSION: Various implementations of cartilage thickness computations are more reproducible than cartilage volume. The larger ROI tends to provide lower variability for the size of the ROI and lower precision errors for cartilage thickness.

Category: Poster

Titel: Various aspects of the popliteal artery and of its terminal branches

Authors: PUSZTAI A.(1), MATUSZ P.(2), MASTACANEANU M.(3), ZAHOI D.(1), MOISE L.(1),

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Abstract:

Purpose: To evaluate the anatomical structures of the poplitea artery and branches, in view of reconstructive surgery necessities.

Method: The popliteal artery and its branches belong to this category. We studied the variability of the popliteal artery and of its branches on 120 casts.

Results: We found three distinct morphological types: Type I (modal) (86.67% cases), where the popliteal artery has an oblique inferior and lateral trajectory towards the inferior margin of the popliteus muscle, where it gives birth to the anterior tibial and posterior tibial artery. The peroneal (fibular) artery originates from the lateral aspect of the posterior tibial artery, at about 3-3.5 cm inferior to the origin of the anterior tibial artery. Type II (9.16% cases), where the anterior and posterior tibial arteries have a high origin (at the upper margin of the popliteus muscle). The initial trajectory of the anterior tibial artery is retro muscular in 8.33% cases and pre muscular (popliteus muscle) in 0.83% cases. Within this morphological type, in 2.50% cases the peroneal (fibular) artery originates into the trunk of the anterior tibial artery. Type III (0.83% cases) (1/120 cases), where the anterior tibial artery, the posterior tibial artery and the peroneal (fibular) artery have a common origin, at the level of the inferior margin of the popliteus muscle.

Conclusions: These aspects of morphologic variability should be considered during the surgical approach when performing microsurgical reconstructions.

Category: Poster

Titel: The muscular territory of the popliteal artery angiozone

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Abstract:

Purpose: To evaluate the muscular territory of distribution of the popliteal artery branches, for surgical planning on anatomical bases.

Methods: We studied the muscular territory of the popliteal artery angiozone on 60 anatomical dissection casts and also on 10 lower legs amputated for surgical diseases. For the anatomical casts we used the macroscopic and the mezosopic dissection. The amputated lower legs were first injected with China ink of different colors (specific for each source artery), followed by injection with Technovit 7143 to underline the arterial trunks and to facilitate their dissection.

Results: Correlations between dissection and injecting of the anatomical structures of the calf showed the muscular territory of the popliteal artery angiozone at calf level, represented by: the proximal part of gastrocnemius muscle (the upper and middle part of the medial and latera muscle body), the upper part of the soleus muscle, the whole muscular body of plantaris longus. These muscles belong to the superficial plane of the calf's posterior compartment.

Conclusions: Knowing these anatomical aspects regarding the extension of the muscular territory of the popliteal artery is the base for evaluation of the skin territory of this angiozone, constituting the theoretical base for a safe surgical approach of the posterior aspect of the knee and calf.

Category: Poster

Titel:Saphenous femoral junction – an anatomical study

Authors: Cebzan C.(1),Sisu A.(1),Petrescu C.(1),Niculescu V.(1),Niculescu M.C.(1),Matusz P.(1),Rusu M.C.(2),

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Abstract:

For the present study we made macroscopic dissections on adult human bodies, at femoral triangle of Scarpa, for a 56 saphenous femoral junctions. It was systematized the tributaries in superior and inferior ones. The superior tributaries are: superficial epigastria vein, superficial iliac circumflex vein supra pubian vein and extern pudenda veins. The inferior tributaries were considered the lateral anterior femoral vein, lateral posterior femoral vein, anterior accessory saphenous vein, posterior accessory saphenous vein (Cruveilhier). Venous morphology at saphenous femoral junction level is individual and to define a morphological model is hazardous. At 24 SFJ studied we determined distances on vertical line between the draining point of great saphenous vein in femoral vein and the inguinal ligament. SFJ resection is one of essential techniques which allow a right treatment of varicose disease, preventing the recurrences and surgical reoperations. Among the complications associate with saphenous vein stripping, the most serious is associating an arterial lesion. But this complication is quite rare. Despite the fact the accessories saphenous vein represents a key element for explain the after surgical recurrences are its involved in varicose post stripping too. To approach SFJ must have in count the individual venous morphological variations possibility, sometimes important. A wide expose of SFJ allows a morphological evaluation in lesion and to realizing a good procedure for preventing the recurrences (in case of surgical treatment of varicose disease).

Category: Poster

Titel:Saphenous territory perforating veins – An anatomical study

Authors: Cebzan C.(1),Sisu A.(1),Petrescu C.(1),Niculescu M.C.(1),Niculescu V.(1),Matusz P.(1),Rusu M.C.(2),

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Abstract:

Direct perforating veins are classifying in: foot perforates, maleola regions perforates, shank perforates, knee perforates, thigh perforates and gluteal perforates. We realized the saphenous territory perforated study on 50 adult human bodies, 24 males and 26 females, bilaterally dissected. Detailed dissection was followed by an adequate digital photographic documentation of results. Anatomical pieces were dissected in superficial plane, praising the whole superficial venous network, viewing the penetration level in the fasciae by perforates veins. The crural fasciae perforation place is varying in high: 4 cm for Cockett I vein; 15 cm for Cockett II vein; 4 cm for Cockett III vein; 4 cm for Cockett IV vein (perforate at 24 cm); 8 cm for par tibiae perforates veins. We also determined, at Linton line level (a vertical line at 1 cm posterior of medial maleola), placed on high the Cockett perforates and the par tibiae ones (perforate at 24 cm, middle par tibiae, superior par tibiae and Boyd perforate), and measured starting with the medial maleola level. The most simply perforate unit is constituted from: a suprabaponevrotic segment; a transaponevrotic segment (can be sometimes accompanied by an arteriole and a nerve); a subaponevrotic segment; the valvular equipment (1 or 2 supraaponevrotic valves, 1-3 subaponevrotic valves). Valves present the same structure with the deep venous system. Perforating veins are the most important, especially those named “Cockett perforates”, which have a primordial role in producing the pathological events in the third lower shank level.

Category: Poster

Titel:Anatomy and surgical effectiveness

Authors: Feigl G.(1),Kos I.(2),Guyot J.(3),Fasel J.(4),Anderhuber F.(1),

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Abstract:

Background: Profound anatomical knowledge and experience of surgeons are essential for safe otological surgery. Dissection on embalmed cadavers with almost lifelike conditions is a useful teaching tool to strengthen the surgeon's experience. The aim of this study is to document changes of success rate in performing Gacek's transmeatal singular neurectomy.

Materials and Method: 96 specimens (24 halves per quarter) embalmed with Thiel's method were dissected without any alterations on the region to be operated on by the surgeon. Successful operations were subdivided into Group A representing direct hits of the osseous canal of the posterior ampullary nerve and group B an arrival at the posterior osseous ampulla or posterior ampullary recess. Unsuccessful operations, where the singular nerve could not be reached through the transmeatal approach, were allocated to group C. All cases classified in group B and C were reinvestigated a second time to evaluate possible reclassifications due to a learning process of the surgeon. The order of dissection, the rate of success and the changes of results in correlation with the numbers of dissected specimens were documented.

Results: Rate of success significantly increased from 54.2% after the first 24 halves to 86.5% after completed the first turn and 97.9% after second turn. The number of new allocation decreased from 11 cases in the first quarter of dissected specimens to zero in the fourth quarter.

Conclusions: This paper strengthens the value of this training method on such specimens and the crucial role of dissection to increase the surgeon's experience.

Category: Poster

Titel: "To think is better than to know, but minor than to see." (J.W.v.Goethe)

Authors: Feja C.(1), Löffler S.(1), Spanel_Borowski K.(1),

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Abstract:

The Institute of Anatomy at Leipzig possesses manifold macroscopical specimens derived from previous centuries. They are exhibited as originals, models, and drawings. A collection of human skulls belongs to one of the treasures. Emil Schmidt (1834-1901), who dedicated his life to medicine and to anthropology, assembled the 1300 skulls from all over the world. Each skull was carefully measured, and the data were recorded in a reference catalogue. Over the times, new objects were acquired on the occasion of international exhibitions. Death masks and plaster casts from the collections of Carl Gustav Carus (1789-1869) and of Möbius (1853-1907) were integrated into the Leipzig skull exposition as well. Nowadays the objects are visited by participants of the courses in Clinical Anatomy, who listen to unique stories about the objects' history with deep interest.

Category: Poster

Titel:Structural transformations of bones of mammals' extremities at different statolocomotion

Authors: Slesarenko N.(1),Gasanguseynova E.(1),Kapustin R.(2),

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Poster was not presented

Titel:Physical development of children in the age from 3 to 10, born and living in areas of Belgorod region of Russia with different levels of ecological pollution

Authors: Krikun E.(1),Boldyr V.(1),Krikun Y.(1),Zinchenko I.(1)Kapustin R.(2),

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Poster was not presented.

Titel:Education of Veterinary Anatomy by Plastination

Authors: Basset aly A.(1),Basset Aly A.(2),

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Poster was not presented

Titel: Too much honour for Max Clara? The Clara cell and the "Third Reich"

Authors: Winkelmann A.(1),

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Abstract:

PURPOSE

Since its original description by Clara in 1937, the club-shaped secretory cells of the bronchiolar epithelium are known as Clara cells. This contribution asks whether Max Clara's support for National Socialism and the context of his histological research justify the honour conferred by naming an anatomical structure after him.

METHODS

Search in historical archives and analysis of publications by Clara and about Clara.

RESULTS

Following work in Innsbruck and Padua, Max Clara (1899-1966) held the chairs of anatomy in Leipzig (1935-1942) and Munich (until 1945). In his inaugural speech in Leipzig, he asked his colleagues to 'line up with the marching columns of our Führer'. He also proposed a 'new' functional anatomy, which he labelled 'holistic'. After 1939, he explicitly saw a parallel between this holism and the '[emerging] totality in the life of the peoples'.

Clara was politically active as NS-Dozentenbundsführer in Leipzig and as chairman of the Anatomische Gesellschaft. After the war, he was officially cleared by the "denazification" process, a decision partly based on wrong assumptions.

Clara's broad histological research in Leipzig benefited from the rising number of executions after 1933, giving him 'perfectly fixed material'. His original description of the bronchial epithelium is based on such human tissue preserved 'immediately after death'. For investigations on brain tissue, Clara obviously asked prison staff to give one of the doomed prisoners vitamin C tablets for research purposes. Apparently, he was ready to see those sentenced to death as 'guinea pigs'.

CONCLUSION

The Clara cell should be renamed.

Category: Poster

Titel:Emotional stress influence on the structure of some peripheral immune system organs in vistar rats with different emotional stress resistance

Authors: Bakhmet A.(1),Sapin M.(1),Kuhnel W.(2),

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Abstract:

Purpose: The cell composition and the cytostructure of functionally active zones of the spleen, inguinal lymph nodes (ILN) and lymphoid (Payer's) patches of 104 Wistar male rats as a well as changes of peripheral blood smears of laboratory animals of both experimental and control groups with various types of individual stability to stress have been studied.

Methods: The rats were killed by decapitation one hour after emotional stress. The material was prepared and stained by standard histological and immunohistochemical methods.

Results: The density of the arrangement of cells per square unit in the internodular lymphoid zone (ILZ) of the ILN of rats stable to stress was $28,6 \pm 1,8$ cells, compare to the control group of rats, where it was higher and averaged $30,2 \pm 2,7$ cells. The density of the arrangement of cells per square unit in the ILZ of the ILN of rats predisposed to emotional stress, one hour later the emotional stress, was $24,6 \pm 1,5$ cells, and in the control group of animals it was $34,2 \pm 2,5$ cells.

Conclusion: The study of the microanatomy of the inguinal lymph nodes of rats of both experimental and control groups with various type of individual stability to stress has shown, that one hour after the emotional stress the rats, predisposed to stress, reacted greater to the influence of emotional stress than stable to stress animals.

Category: Poster

Title:3D representation of the histological aspects of lymph nodes

Authors: Ghazali S

Adresses: Snandaj, Iran

No abstract available

Titel: The unique microanatomy of ileal Peyer's patches of the one humped camel (*Camelus dromedarius*) is not age-dependent

Authors: Zidan M.(1), Pabst R.(2),

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Abstract:

Purpose: The Peyer's patches (PP) have been intensely investigated in several species since this is an important entry site for antigens and infectious agents. There are many PP in the jejunum, and in some species such as ruminants, carnivora and omnivora a different continuous PP is found in the terminal ileum. This PP disappears with age in these species.

Methods: The ileal PP (IPP) has only been studied in the camel by light microscopy. Therefore, the localization of IPP in the dromedary camel at different ages, as well as the histology and ultrastructures were investigated.

Results: The IPP were characteristically seen as dark rose-colored isolated cup-shaped structures, arranged in three irregular rows. The central row was antimesenteric. Each patch was formed by several mainly elongated dome regions flanked by intestinal villi. In cross sections these domes appeared as short, wide villi. The domes were formed from lymphoid follicles covered with a typical dome-associated epithelium of enterocytes and M cells without any goblet cells. The M cells showed variable appearance depending on the functional status. The lymphoid follicles expressed clear germinal centers. High endothelial venules were localized in the interfollicular region.

Conclusions: In contrast to other species the IPP were still present with a comparable structure in camels of 25 years of age.

Category: Poster

Titel: Surface marker-defined head kidney granulocytes and B-lymphocytes of rainbow trout express benzo[a]pyrene-inducible cytochrome P4501A protein

Authors: Nakayama A.(1), Riesen I.(1), Köllner B.(2), Segner H.(1), Eppler E.(3),

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Abstract:

Polycyclic aromatic hydrocarbons (PAHs) such as benzo[a]pyrene (BaP) are immunotoxic to fish. Metabolism of PAHs in immune cells has been implicated in PAH immunotoxicity in mammals, but for fish the presence of metabolic enzymes in immune cells is less clear. We aim to examine localization and induction of the BaP-metabolising biotransformation enzyme, cytochrome P4501A, in head kidney immune cells of rainbow trout. In the first step, we measured induction of CYP1A-dependent 7-ethoxyresorufin-O-deethylase (EROD) activity and CYP1A protein in head kidney of rainbow trout treated with a single intraperitoneal injection of 25 mg BaP/kg body weight. From days 3 to 10 post-injection, the BaP treatment led to a significant elevation of EROD and CYP1A protein in head kidney and liver, with CYP1A expression levels in the head kidney being much lower than in the liver. Next, we examined the cellular localization of CYP1A protein in head kidney vascular endothelial, endocrine and lymphoid cells. CYP1A immunoreactivity was detectable only in BaP-treated trout, where it was localized in endothelial and lymphoid cells. Finally, we performed double immunostaining for CYP1A and surface markers of rainbow trout immune cells to identify the CYP1A-positive head kidney cells. BaP-inducible CYP1A was present in B-lymphocytes and granulocytes. Our findings demonstrate for the first time PAH-inducible CYP1A expression in specific piscine immune cell types, thereby providing a basis to understand the cellular basis of PAH immunotoxicity in fish.

Category: Poster

Titel:Differential influence of growth hormone (GH) and 17alpha-ethinylestradiol (EE2) on IGF-I and estrogen receptor gene expression in fish immune organs

Authors: Shved N.(1),Berishvili G.(1),Baroiller J.(2),Eppler E.(3),

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Abstract:

The enormous enlargement of aquaculture as a world-wide food production factor goes along with rearing of fish at high densities. This has led to increasing problems caused by infectious diseases and, thus, has strongly enhanced the interest in fish immune system and its modes of regulation. There is some molecular biological evidence that growth hormone (GH) and insulin-like growth factor I (IGF-I) which promote differentiation, proliferation and growth are produced in lymphoid tissues. However, data on their qualitative and quantitative changes after experimental treatment which would shed light on the assumed regulatory impact of GH, IGF-I and estrogens on the fish immune system are scarce. Thus, we investigated the influence of GH on IGF-I gene expression in immune organs of a representative bony fish, the tilapia, by intraperitoneal injection of fish GH. Three consecutive injections of low doses of GH led to a significant upregulation of IGF-I mRNA in head kidney as detected by real-time PCR and in situ hybridization, but no effect was observed in spleen. Feeding of developing tilapia with food enriched with 17alpha-ethinylestradiol (EE2) resulted in a lasting impairment of spleen growth and further lowered IGF-I mRNA expression in both spleen and head kidney. Estrogen receptor-alpha (ER-alpha) mRNA expression in spleen showed a trend to increase but remained unchanged in head kidney. Our preliminary results provide a basis for further research on the mechanisms underlying potential interactions of the hormone and immune systems in fish.

Category: Poster

Title: The IHC Expression of Morphological Changes on Placental Level Using Antibody Anti-CD34

Authors: Frandes C.(1), Radu A.(1), Hermenean A.(1), Coralia C.(1),

(1) Morfological Sciences Department, Western "Vasile Goldis" University of Arad, Romania

Purpose: In the hereby study it was made use of the monoclonal antibody CD43 in order to evaluate the structural placental vascular alterations of the placentas resulted from births with newborns that presented multiple malformations.

Methods: The immunohistochemical (IHC) expression of CD34 marker was studied on 72 placental fragments from newborns with malformations of any kind, most of them incompatible with life. Another 25 placentas were provided from normal newborns delivered on term and served as a control group.

Results: IHC reactions for CD34 indicate several abnormal diameters of blood vessels, associated with perivascular oedema, villous system conglomerates and many syncytial buds. The CD34 marker had a positive expression in vascular endothelium, but not in the trophoblastic epithelium on the pathological placental level.

Conclusions: Our results emphasize that in the placental fragments coming from newborns that have severe life-incompatible malformations there are multiple pathological vascular alterations. All these changes from normal will lead to several hypoxic - type repercussions on the product of conception whose development will be eventually impaired. On the other hand, in the normal placentas we did not find any important vascular modifications.

Category: Poster

Titel:Antimicrobial peptides at the ocular surface

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Abstract:

Purpose. Human ocular surface epithelia express a multitude of different antimicrobial peptides (AMPs) which may help to protect the eye against infection and colonisation of microorganisms. In this study the expression and regulation of additional AMPs (human beta-defensin 1-4 and psoriasin) at the ocular surface were investigated.

Methods. The expression of AMPs was determined by RT-PCR and immunohistochemistry in tissues of the ocular surface and the lacrimal apparatus. Regulation and inducibility of AMPs were studied in a human corneal and a conjunctival epithelial cell line after challenge with frequent ocular pathogens as well as proinflammatory cytokines by Real-time PCR and ELISA.

Results. RT-PCR results revealed constitutive expression of hBD1, -2 and -4 in the conjunctiva and the nasolacrimal ducts. Cornea and lacrimal gland only expressed hBD1.

RT-PCR and Western blot revealed expression and presence of psoriasin in the cornea, the conjunctiva and the nasolacrimal ducts. Furthermore, highest amounts of psoriasin were detected in lacrimal fluid (~170 ng/ml) and the Meibomian glands. Proinflammatory cytokines induced hBD2 and -3 expression and secretion in HCjEC and HCEC.

Supernatants of *Staphylococcus aureus* and *Haemophilus influenzae* increased the relative expression of hBD2 and -3 mRNA. No induction of psoriasin was observed after stimulation with supernatants of different bacteria, whereas IL-1b and VEGF strongly induced psoriasin.

Conclusions. Our results indicate specific expression and regulation of AMPs against frequent ocular surface pathogens and proinflammatory cytokines. These results suggest that AMPs may play a protective role at the ocular surface and are part of the innate immune system of the ocular surface.

Category: Poster

Titel:Immunomorphologic features of the skin in Behcet disease

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Abstract:

Lelioara Tocan¹, Carmen Zamfir¹ and Elena Cojocaru¹

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Purpose: Our aim was trying to identify specific aspects in skin biopsies in order to facilitate the diagnosis of Behcet disease and for differentiating it from other multisystemic diseases.

Methods: we studied skin biopsies of three different cases of Behcet disease. From every patient we took punch biopsies of skin which had been studied by three different methods: routine histology, direct immunofluorescence and immunohistochemistry.

Results: in usual staining the skin demonstrated inflammatory lesions around the vessels in the superficial and profound dermis. Immunofluorescence was diffusely positive in the vessels walls and some inflammatory cells. Immunohistochemistry was positive for CD3 and CD34; S100 protein was inconstantly positive in our patients.

Conclusions: endothelial proliferation and inflammation are main features of the disease.

Antibodies directed to the endothelium are evidentiated by immunofluorescence.

Immunohistochemistry shows a mixture of inflammatory cells among which the T cells seems to be prevalent.

Category: Poster

Title: Upregulation of vasoactive intestinal polypeptide in human thymus after chronic thyroiditis

Authors: Sokal A

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No abstract available

Titel: The fetal mouse pars tuberalis contains a circadian oscillator

Authors: Ansari N.(1), Korf H.(2), von Gall C.(1),

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Abstract:

For the fetus maternal melatonin provides an important rhythmic endocrine signal encoding information about phase and length of the night. A major target tissue of melatonin is the hypophysial pars tuberalis (PT), a peripheral oscillator that expresses clock genes *mPer1*, *mPer2*, *mCry1* and *mCry2* in a circadian manner. In adults *mPer1* expression peaks during late night and is inhibited by melatonin whereas *mCry1* expression peaks during mid-night and is activated by melatonin. The clock gene proteins *mPER1/2* and *mCRY1/2* form a negative regulator complex that interferes with the action of the transcription factors *CLOCK* and *BMAL1* and peaks during mid-day. Since little is known about the ontogenetic development of the circadian oscillator in the PT we analyzed *mCry1* and *mPer1* mRNA levels as well as *CLOCK*-, *BMAL1*-, *mPER1*-, *mPER2*-, *mCRY1*- and *mCRY2*-immunoreactions in the PT of fetal (embryonic day 18) mice by means of in situ hybridization and immunohistochemistry at four different time points. We found rhythmic changes in *mPer1* and *mCry1* mRNA levels with a peak at CT00 and CT18, respectively. *BMAL1*- and *CLOCK*-immunoreaction was strong throughout the circadian cycle and *mPER1/2* and *mCRY1/2* were rhythmic with a peak during mid-day. We conclude the fetal PT represents a circadian oscillator that comprises the same components as the adult PT. This fetal PT oscillator is able to respond to melatonin and thus can be entrained by the hormone which is derived from the maternal circulation and crosses the placenta.

Category: Poster

Titel: Behavioral effects and pattern of brain c-fos mRNA induced by TMT, a component of fox odor in heterozygous GAD67-GFP mice

Authors: Janitzky K.(1), Linke R.(1), Schwegler H.(1), Stork O.(2), Roskoden T.(1),

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Abstract:

The aim of the present study was to investigate behavioral effects and brain activation induced by predator odor using 2,5-dihydro-2,4,5 trimethylthiazoline (TMT), a volatile component of the anal gland secretion of the red fox, in adult male GAD-GFP-knock in-mice (Tamamaki et al., 2003, J Comp Neurol 467:60-79).

TMT and the control substance diethylphthalate, respectively, were presented to habituated mice for 30, 40 or 50 minutes in a small box and behavior was monitored. Immediately after odor presentation, mice were decapitated and selected brain areas were isolated to measure c-fos mRNA induction by qRT-PCR as a marker of changes in neuronal activity.

Elevated freezing behavior was displayed as general defensive response in TMT exposed GFP-mice. The qRT-PCR established a strong TMT induced activation of c-fos mRNA expression in the bed nucleus of the stria terminalis especially in mice which were exposed to TMT for 30 minutes and decapitated afterwards.

Retrograde tracing experiments show that afferents to the piriform cortex originate almost exclusively in the mitral cell layer of the olfactory bulb, in the anterior olfactory nuclei and the dorsal tenia tecta but we also found afferents from the agranular insular cortex.

Anterogradely labeled fibers indicate that projections from the piriform cortex primarily innervate the granular cell layer of the olfactory bulb, the olfactory tubercle, the medial septum, the anterior commissure, stria terminalis, the anterior cortical amygdaloid nucleus and the lateral entorhinal cortex. The investigation of target neurons in the projection pathway from the piriform cortex was made with regard to the GABAergic system.

Category: Poster

Titel:Vomeronasal organ in pigs: topographical variation of epithelial lining and irregular distribution pattern of olfactory neurons

Authors: Simon K.(1),Steffl M.(1),Schweiger M.(1),Amselgruber W.(1),

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Abstract:

Purpose: To investigate the topographic distribution of the different surface epithelia and the localization of olfactory neurons within the sensory epithelium of the porcine vomeronasal organ (VNO).

Methods: VNO of 28 male and female pigs ranging in age from seven weeks to five years was analysed by scanning electron microscopy (SEM) and immunohistochemistry. Staining procedure was performed using two different antibodies, one against the olfactory marker protein (OMP) and the other against the actin-binding protein villin.

Results: SEM studies clearly demonstrate a characteristic topographic distribution of the different surface epithelia of the VNO. While the rostral segment shows a transitional zone of squamous epithelium, the organ-specific epithelial lining within the medial range is regularly present in two typical variants: only sensory epithelium or one third captured by respiratory epithelium. Immunohistochemically, most but not all olfactory neurons could be selectively labelled by the antibody against OMP. Intensely OMP-stained neurons are distributed irregularly in the basal and apical region of the sensory epithelium. Moreover, OMP immunoreactivity is expressed in dendrites and dendritic knobs of the olfactory neurons. Additionally, immunostaining of villin is present not only in the dendritic knob but also in the microvilli of the olfactory neurons which are covered by the longer microvilli of the supporting cells.

Conclusions: It is suggested that there are profound differences in the morphology of the VNO between laboratory rodents and domestic animals. Furthermore, in the pig the differentiation of the olfactory neurons within the sensory epithelium occurs independently from their localization.

Category: Poster

Titel:Ciliary neurotrophic factor (CNTF) synthesis and neurite growth in cocultures of olfactory receptor neurons (ORN) and olfactory ensheathing cells (OEC)

Authors: Bömmel H.(1),Asan E.(1),

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Abstract:

The proportion of CNTF-immunoreactive(ir) rat OEC in vitro decreases with culture duration, but is increased again by coculturing with ORN. We investigated whether this effect is caused by direct ORN/OEC contact and whether it is specific for ORN. Additionally, we characterized OEC cultures from wildtype and CNTF-deficient mice, and did preliminary studies comparing ORN neurite growth in these cocultures to assess CNTF functions in the peripheral olfactory system. OEC, ORN and cortical neurons (CN) were isolated from neonatal rodents. Cocultures of ORN or CN and late passage (≥p3) OEC were done in direct contact or spatially separated. The proportion of CNTF-ir rat OEC increased ~1.7-2fold only if the OEC were in direct contact with neurons (ORN or CN). Like rat OEC, OEC from wildtype and CNTF-deficient mice showed increasing homogeneity with culture duration (>90% p75NTR-, S100beta-, GFAP-ir OEC after p3 in all cultures). In wildtype mouse OEC, the proportion of CNTF-ir OEC was lower at p1 (23%) than in rat cultures (35%), but similarly decreased with culture duration (mice/rats p2: 17%/20%, p4: < 10%), and increased again in ORN/OEC direct contact cultures. Surprisingly, ORN cultured on CNTF-deficient OEC showed increased neurite length compared to ORN cultured on OEC from wildtype mice. CNTF production in OEC appears to be induced by direct neuronal contact, independent of the type of contacting neuron. OEC from rats, wildtype and CNTF-deficient mice show similar in vitro characteristics. The finding that ORN neurite growth is enhanced in cocultures with CNTF-deficient OEC is subject of further analysis.

Category: Poster

Titel:Effect of 3-nitropropionic acid on cytochrome c oxidase subunit IV isoform expression, enzyme kinetics, mitochondrial function, and viability of striatal and cortical astrocytes and neurons

Authors: Arnold S.(1),Singh S.(1),Misiak M.(1),Beyer C.(1),

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Abstract:

Purpose: Mitochondrial energy production is essential for brain functioning. Inhibition or deregulation of mitochondrial respiratory chain complexes has detrimental effects on function and survival of neural cells. Application of 3-nitropropionic acid (3-NPA), a mitochondrial toxin used as an in vitro M. Huntington model, inhibits succinate dehydrogenase. We propose an additional mechanism of 3-NPA toxicity on mitochondrial function which involves cytochrome c oxidase (COX).

Methods: Primary striatal and cortical astrocytes/neurons were treated with 3-NPA. COX subunit IV-1 and IV-2 isoform expression was quantified by RT-PCR. Polarographic enzyme activity measurements, analysis of ROS production and cell viability were performed.

Results: 3-NPA affected COX IV-1/IV-2 expression and cell viability in a brain region- and cell type-specific manner. Under physiological conditions, COX IV-1 isoform is expressed which is important for adjusting energy production to energetic requirements by binding of ATP. In addition to COX IV-1, neurons showed elevated COX IV-2 levels under physiological conditions, whereas 3-NPA treatment increased COX IV-2 transcripts in striatal neurons and in astrocytes from cortex and striatum. Elevated COX IV-2 expression caused increased COX activity, abolished enzyme sensitivity towards the cellular energy level, elevated ROS production, and decreased cell viability. Application of COX IV-2 siRNA indicated the specificity of this isoform for COX kinetics and cell viability.

Conclusions: 3-NPA affected COX subunit IV isoform expression which was accompanied by changes in enzyme kinetics and impairment of neural cell viability.

Supported by DFG (Emmy Noether-Program, SA), START (RWTH Aachen, SA).

Category: Poster

Titel: Palmitoylethanolamide (PEA) exerts neuroprotective effects in excitotoxically lesioned organotypic hippocampal slice cultures (OHSC) via peroxisome proliferator-activated receptor (PPAR)-alpha

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Abstract:

Palmitoylethanolamide (PEA), the naturally occurring fatty acid amide of ethanolamine and palmitic acid, is an endogenous lipid that modulates pain and inflammation. Although the anti-inflammatory effects of PEA are well established, it is still open which receptors mediate these actions. Recent studies indicate that PEA might act through the peroxisome proliferator-activated receptor (PPAR). In previous studies we have shown that PEA (0.01 μ M) reduced the number of activated microglial cells and elicited neuroprotective effects in excitotoxically lesioned (50 μ M NMDA for 4h) organotypic hippocampal slice cultures (OHSC). To determine the receptor responsible for the PEA-mediated neuroprotection we applied the specific PPAR-gamma antagonist (GW-9662, 0.01 μ M-1.0 μ M) in combination with PEA and the specific PPAR-alpha agonist (WY-14643, 0.01 μ M-1.0 μ M) to lesioned OHSC. To assess the extent of neuronal damage and microglial activation, the numbers of propidium iodide (PI) labeled, degenerating neurons and of isolectine B4-labeled microglial cells in the dentate gyrus of OHSC were calculated by means of confocal laser scanning microscopy. As shown for PEA, application of WY-14643 (0.01 μ M) to lesioned OHSC reduced the number of degenerating neurons and microglial cells. PEA-induced neuroprotection and reduction of microglial cells were still observed when PEA was applied together with GW-9662 (0.01 μ M-1.0 μ M), the specific PPAR-gamma antagonist. These findings suggest that PEA elicits its neuroprotective effects by acting upon PPAR-alpha and ask for PPAR-alpha specific intracellular targets that transmit the neuroprotective effects of PEA.

Category: Poster

Titel: Signaling via the jak/stat pathway inhibits morphological differentiation in neural cells

Authors: Hofmann H.-D.(1), Leemhuis J.(2), Kirsch M.(1), Meyer D.K.(2),

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Abstract:

Typically, CNTF and related gp130-associated cytokines are regarded as neurotrophic proteins promoting survival, neurite formation and differentiation in developing neurons. More recent studies indicate that CNTF, acting via the JAK/STAT3 signaling pathway, inhibits neurogenesis and promotes self renewal of neural stem cells. In the present study, we have investigated how inhibition of JAK/STAT signaling affects cell morphology in cultured rat neocortical astroglial cells and neuronal cell lines.

Primary astrocyte cultures, SH-SY5Y neuroblastoma cells and retinal ganglion cell-derived RGC-5 cells were treated with pharmacological inhibitors of cytokine-related intracellular signaling pathways. Morphological changes were evaluated qualitatively and quantitatively. Activation of signaling pathways was analyzed by Western blotting.

The Janus protein kinase inhibitor (JAK-I) initiated the formation of long processes in cultured astroglial cells, whereas CNTF promoted a flat epithelial morphology. In the neural cell lines, process outgrowth was initiated within two hours after addition of JAK-I and with prolonged exposure, the cells acquired a neuronal morphology. Immunoblots showed that JAK-I inhibited JAK/STAT3 signaling but markedly enhanced phosphorylation of ERK1/2 suggesting that its effects involve disinhibition of Ras/MAPK signaling. In line with this assumption, the induction of morphological changes induced by JAK-I was inhibited by MEK inhibitors (U0126, PD98059) and also by a specific inhibitor of IGF-1 receptor signaling.

We consider these data as evidence that cytokine-mediated activation of JAK kinases can suppress differentiation in neural cells by negatively regulating IGF-1-induced signaling via the Ras/ERK pathway.

Category: Poster

Titel: Neurogenesis within the adult gyrus dentatus of mice: Involvement of p75 receptors

Authors: von Bohlen und Halbach O.(1), Unsicker K.(1),

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Abstract:

Purpose: Aside from binding to the high-affinity receptors of the trk family, all neurotrophins can bind to the low affinity receptor p75^{NTR}. The receptor p75 is highly expressed in the dentate gyrus (DG) of the hippocampus. Since the DG is one of the two brain areas that are known for their capacity to generate new neurons even in the adult brain (neurogenesis), we analyzed the impact of a deletion of p75 by using adult knockout mice (p75^{ExIV}) and their control littermates.

Methods: The time-course of neurogenesis can be subdivided in different steps. During the late phase of neurogenesis, newly formed neurons express the marker doublecortin (DCX). We analyze the rate of neurogenesis in the p75 deficient mice by using an unbiased counting rule. Moreover, we analyzed the morphology of the newly formed DCX-positive neurons within the DG by using 3-dimensional reconstructions.

Results: Comparing adult p75 deficient mice with their age-matched control littermates, not only alterations in the number of DCX-positive neurons were found, but also remarkable differences in the morphology of the DCX-positive neurons, located in the granular layer of the DG.

Conclusion: Based on our preliminary data, it can be suggested that signaling via p75 is important for proper neurogenesis in the adult DG.

Category: Poster

Titel:Microvascular pattern in reeler dentate gyrus differs from wildtype layer specific pattern

Authors: Lindhorst T.(1),Kurz H.(2),Sibbe M.(1),Frotscher M.(1),Förster E.(3),

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Abstract:

The reeler mutant mouse is well known for its malformed neuronal layers in the cerebral cortex. Whereas neuronal migration defects in reeler have been subject of numerous studies, the accompanying alterations of the cerebral blood vessel network are poorly characterized. Molecules secreted by cortical neurons, such as VEGF, are known to be involved in shaping the capillary pattern. In turn, vascular endothelial cells may stimulate neurogenesis by adult neural stem cells. Thus, developmental changes of the vascular pattern might influence the rate of stem cell proliferation in the adult. In support of this line, it was shown that neurogenesis is reduced in the dentate gyrus of adult reeler mice (Zhao et al. 2007). We here report on first steps to unravel mutual influences of neuronal migration and vascular growth in reeler by comparing the development of the microvascular patterns in the dentate gyri of wildtype (WT) and reeler mice. Remarkably, quantification revealed a decreasing vessel bifurcation frequency in the developing reeler dentate gyrus, whereas during WT development, microvessel bifurcation frequency increased. In addition, layer specific bifurcation frequencies were found to be characteristic for the dentate gyrus of WT mice at all analyzed stages, but not in reeler where a compact granule cell layer fails to form. Our findings suggest that correct patterning of microvessels in the dentate gyrus depends on proper positioning of dentate granule cells. Supported by DFG (SFB 505 and SFB TR3). Reference: Zhao et al. (2007) Dev Neurosci 29, 84-90.

Category: Poster

Titel: Infection of rats with Borna disease virus results in a decrease of reelin expressing Cajal-Retzius cells in the dentate gyrus

Authors: Goblet S.(1), Schwemmle M.(2), Schmid S.(2), Heimrich B.(1),

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Abstract:

In the hippocampus of Borna disease virus (BDV)-infected newborn rats, dentate granule cells (DGCs) undergo progressive cell death. Since BDV is non-cytotoxic, factors contributing to this neurodevelopmental damage of a specific cell population are unknown. Reelin secreting Cajal-Retzius (CR) cells in the marginal zone of the dentate gyrus are known to play an important role for the development of the laminar organization of the DG. Here we examined, whether Cajal-Retzius cells are susceptible to BDV infection and whether BDV infection is associated with an altered reelin expression or changes in the number of CR cells. From postnatal day 15 onwards we could detect BDV-infected CR cells in the DG. At 6 weeks post infection when granule cell death had already started we observed a decrease in numbers of reelin expressing CR cells in the DG. At 9 weeks post infection the majority of granule cells had disappeared and the number of reelin-mRNA expressing neurons was reduced to about 60 % in the DG compared to non-infected animals. In the hippocampus proper counting of CR cells revealed similar values in controls and in BDV-infected rats.

In summary, we could demonstrate that BDV-infection of newborn rats does not only cause a selective damage of granule cells but also a decrease of reelin expressing CR cells in the dentate gyrus.

(Supported by the DFG: He 1520)

Category: Poster

Titel:CA1 and CA3 of aged rat hippocampus - structural changes of synaptic compartment

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Abstract:

Tissue of CA1 and CA3 of hippocampus (HP) of male rats of Wistar strain 900-1800 postnatal days (P) old have been investigated. Groups P30 and P90 were used as controls. Electron-microscopical (EM) study and immunocytochemical markers (GSA, GFAP, β-III-tubulin, synaptophysin, Ca⁺⁺ binding proteins: calbindin-parvalbumin) examination have been performed. In the neuronal population between impaired elements, ultimately degenerated neurons, the cells, morphofunctional features of which were not changed, were present. In some of the synaptic compartments, large fields of vesicles were seen. In average, diameter of vesicles was smaller than that of synaptic vesicles of control tissue. Tight accumulations of vesicles, not homogeneous, were usually found in the central part of axon, often without an apparent contact with the synapse. At the synaptic membrane of these axons, only a small amount of vesicles were present. Such types of axons were in synaptic contact with the altered dendrites or neuron bodies. Similar finding was observed in HP of young asphyctic animal. Neurons, synaptic contact of which had been lost or pathologically modified, degenerated. Processes of hypertrophied and swollen astrocytes and activated microglia were found in the vicinity of synapses. It is supposed, that the transport of mediator in the age/hypoxia changed tissue might have been effectively blocked by the tight accumulation of degenerated vesicles in these compartments.

Category: Poster

Titel:Aromatase activity is essential for the induction of LTP in hippocampal slice cultures.

Authors: Zhou L.(1),Glassmeier G.(2),Fester L.(1),Dudzinski D.(1),von Lossow R.(1),Schwarz J.(3),Rune G.(1),

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Abstract:

Aromatase activity is essential for the induction of LTP in hippocampal slice cultures

Lepu Zhou¹, Günter Glassmeier², +, Lars Fester¹, Danuta Dudzinski¹, Richard von Lossow¹, Jürgen Schwarz², Gabriele M. Rune¹

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In a previous study, we have shown that endogenous hippocampal estrogen synthesis maintains hippocampal spine synapses. In the study presented here, we focused on the functional significance of spine loss after inhibition of local estrogen synthesis, using long-term potentiation at CA3-CA1 synapses as a cellular parameter for memory. To this end, we reduced hippocampal estrogen synthesis in vitro with letrozole, a reversible non-steroidal aromatase inhibitor. In hippocampal slice cultures, letrozole treatment resulted in a significant decrease of 17 β -estradiol, which was accompanied by a significant decrease in the density of spine synapses in the stratum radiatum of CA1. In letrozole-treated cultures, theta burst stimulation of CA3-CA1 Schaffer collaterals failed to induce long-term potentiation. Consistently, immunoreactivity of NR2B NMDA receptors, which mediate estradiol-induced long-term potentiation, was downregulated in the stratum radiatum of the CA1 region in the letrozole-treated slice cultures. All effects in response to letrozole were rescued by estradiol. Our findings indicate that aromatase activity in the hippocampus is essential for long-term potentiation and may account for memory deficits of letrozole-treated patients in the therapy of breast cancer.

Category: Poster

Titel:Luteinizing hormone influences synaptic plasticity by stimulation of hippocampal estradiol synthesis

Authors: Koenig A.(1),Kohlmann P.(1),Jarry H.(2),Rune G.(1),Prange-Kiel J.(1),

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Abstract:

Recently, we demonstrated that Gonadotropin-releasing hormone (GnRH) regulates synaptic plasticity via its influence of hippocampal estradiol (E2) synthesis. In the hypothalamic-pituitary-gonadal axis the effect of GnRH on the gonadal E2 synthesis is mediated by Luteinizing hormone (LH). LH receptors (LH-R) have been described to be also expressed in hippocampal neurons. Therefore, we investigated the effect of LH on hippocampal E2 synthesis and synaptic plasticity.

Treatment of rat hippocampal dispersion cultures with LH resulted in a dose-dependent increase in the amount of E2 released into the medium, as measured by RIA.

Immunohistochemistry and subsequent image analysis revealed that the expression of spinophilin, a postsynaptic marker, was regulated in a similar manner. To test whether the effect of LH on the spinophilin expression was mediated by the LH-induced increase in estradiol synthesis, we treated dispersion cultures simultaneously with LH and the aromatase inhibitor letrozole. The inhibition of estradiol synthesis by letrozole indeed abolished the positive effect of LH on spinophilin expression. The hypothesis that LH plays a role in the regulation of synaptic plasticity was further substantiated by the finding that the expression of LH-R was increased after estradiol treatment of hippocampal dispersion cultures but decreased after inhibition of local estradiol synthesis by letrozole.

From these results it might be conclude that LH is a regulator of hippocampal synaptic plasticity by its effect on local estradiol synthesis.

Supported by DFG (PR703/2-1)

Category: Poster

Titel:Auto/paracrine regulation of aromatase activity in hippocampal neurons

Authors: Ossig C.(1),Labitzke J.(1),Kornek T.(1),Fester L.(1),Rune G.(1),

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Abstract:

In previous reports, we have shown that aromatase, the final enzyme in estrogen synthesis, is expressed and functional in hippocampal neurons, including synapses, as demonstrated by in situ hybridization, immunohistochemistry, and by measurements of 17β -estradiol in the culture medium, using a RIA. Aromatase is regulated by GnRH in an endocrine fashion and correspondingly varies during the estrous cycle in females (Prange-Kiel et al., 2007). In the study presented here, we studied auto/paracrine regulation of aromatase activity in rat hippocampal neurons. The availability of substrates or precursors resp. of estrogen synthesis determines aromatase activity. Application of cholesterol and testosterone to hippocampal cultures largely enhance the release of 17β -estradiol into the culture medium. Inhibition of aromatase activity was found in response to high doses of estradiol to the cultures, indicating inhibition of the enzyme by its product. The release of Ca^{2+} from intracellular stores, either induced by caffeine or NMDA, downregulates aromatase activity, whereas the enzyme is upregulated in the absence of Ca^{2+} release, as found after depletion of Ca^{2+} stores using thapsigargin. Our findings show that estrogen-regulated synaptogenesis widely depends on local regulation of aromatase.

Category: Poster

Titel: Is neuronal aromatase activity neuroprotective in Alzheimer's disease?

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Abstract:

Alzheimer's disease (AD) is characterized by disturbed cholesterol homeostasis, which is presumed to contribute to gradual and irreversible synapse loss in the AD brains. Increased catabolism of cholesterol (Corton et al., 1994) and reduced brain membrane cholesterol in AD brain tissue (Svennerholm et al. 1994; Abdad-Rodriguez et al. 2004) was found to be associated with a higher concentration of free cholesterol in damaged tangle-bearing neurons compared to adjacent tangle-free neurons (Distl et al., 2001). According to our previous data, (Fester et al. 2007) these high free cholesterol concentrations, in turn, could serve as precursors for estradiol synthesis and counteract synapse loss in Alzheimer's disease. In fact, in hippocampi of AD patients, we found StAR to be upregulated indicating an enhanced access of cholesterol to the steroidogenic pathway. Furthermore, in AD brains, in particular in the hippocampus, aromatase expression was upregulated in principal neurons as compared to age matched controls. This was true for men and for women. Our data support the potential neuroprotective role of locally produced estradiol in Alzheimer's disease.

Category: Poster

Titel: Combined estrogen and progesterone treatment prevents neuronal cell injury caused by serum-glucose deprivation

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Abstract:

Purpose: Estrogen and progesterone are well-recognized neuroprotective factors in the adult CNS. Both hormones may also account for known sex-differences in the incidence rate and severeness of neurological and neurodegenerative diseases. Data are controversially discussed concerning steroid-dependent neuronal protection in animal stroke models.

Methods: Primary murine neuronal cultures were kept under a combined serum-glucose deprivation (CSGD) for 6 h to mimic ischemic conditions. Cultures were simultaneously raised with or without steroids. Cell viability was assessed by LDH release, trypan blue staining, and by measuring metabolic activity (MTT test).

Results: CSGD caused significant cell death in cultured neurons (~50%). The exposure to 17beta-estradiol or progesterone alone resulted in an apparent but moderate prevention of cell death. The combined treatment with both steroids abolished CSGD most effectively. Protective effects of 17beta-estradiol and progesterone were not inhibited by ICI 182,780 (estrogen receptor antagonist) or mifepristone (progesterone receptor antagonist). In contrast, the administration of PD98059 (MEK1 inhibitor) and LY294002 (PI3 kinase inhibitor) antagonized steroid effects.

Conclusion: These data support the concept that both female sex steroids can protect neurons from cell death under stroke-like conditions. Both hormones are required to fully achieve this effect. Furthermore, non-classical steroid mechanisms independent of classical nuclear signaling appear to operate to mediate neuronal protection.

Category: Poster

Titel: Transgenic rats as a model of Huntington's disease demonstrate sex-specific differences

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Abstract:

Sex-specific differences in patients suffering from Huntington's disease (HD) have not yet been studied in detail. However, animal models provide an alternative approach to investigate potential sex-specific differences. Here, we used female and male transgenic (tg) HD rats with a 51 CAG repeat elongation and control rats to determine histopathological differences between both sexes and genotypes. We investigated the numbers of medium-sized spiny neurons in the striatum by stereological quantification, neurotransmitter receptor density using multi-tracer autoradiography as well as coexpression of estrogen receptor alpha and beta on medium-sized spiny neurons by immunofluorescence. Furthermore, we assessed behavioural differences, energy expenditure, and sex hormone plasma levels across age.

Independently from their sex, tgHD rats showed anxiolytic-like behaviour, exhibited increased levels of food intake as well as home-cage activity scores, the latter being significantly higher in female tgHD rats compared to males. In contrast, only males exhibited a decline of motor function. Interestingly, estradiol levels were increased in four-month-old male tgHD rats, not yet exhibiting typical HD symptoms, but compared to significantly lower levels in symptomatic males. This was associated with a decrease of D1-receptor expression in the striatum only in tgHD males as well as altered numbers of medium-sized spiny neurons. These effects might be due to a differential influence of estrogens, since we found medium-sized spiny neurons also expressing their receptors. In conclusion, these data demonstrate a sex-specific phenotype in tgHD rats with differential clinical courses between sexes, which necessitate further studies on potential downstream mechanisms mediated by sex hormones.

Category: Poster

Titel: Postmortal diagnosis of a dyke-davidoff-masson-syndrom in a 75-year-old woman

Authors: Stoevesandt D.(1), Stock K.(1), Spielmann R.(1), Heine H.(2), Paulsen F.(3), Bräuer L.(2),

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Abstract:

The Dyke-Davidoff-Masson-Syndrome consists of different radiological findings such as hemiatrophy of the cerebrum, hypotrophy of the contralateral cerebellum and hypertrophy of the ipsilateral calvarium and the paranasal sinuses. Clinical findings include hemiparesis or hemiplegia, seizures and/or mental retardation. It typically occurs after cerebral injury due to trauma, ischemia or infection in utero or early childhood.

By means of MRI (Sonata Vision 1,5 Tesla; Siemens, Erlangen) and multislice CT (Sensation 64; Siemens, Erlangen), we were able to report a case of a 75-year old female-body-donor who suffered from a left sided stroke of the internal carotid artery in the course of a tonsillitis at the age of five.

Category: Poster

Titel: Histopathological aspects of the cerebral metastasis

Authors: Indrei A.(1), Dumitrescu G.(2), Sapte E.(3), Zamfir C.(4), Turliuc D.(5), Poeata I.(6),

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Abstract:

The incidence of various histological subtypes of intracranial metastasis was examined in 190 patients with surgically treated intracranial metastasis in "Sfanta Treime" Hospital Iasi Department of Neurosurgery, between 2004 and 2006.

From these patients 102 were males and 88 were females, aged between 34 and 79 years. In 175 patients the primary tumor was detected and in 15 cases the primary tumor was unknown.

In patients with known primary tumour, 130 presented metastasis with similar structure with the primary tumor, but 45 presented metastasis with atypical features, with little or no resemblances with the primary tumor. Of the 102 male patients, the most cases of metastasis have lung origin (52 cases), followed by prostate origin (25 cases) and digestive origin (18 cases). We have met rare cases of metastases with renal or hepatic origin. In female patients the most of cerebral metastasis had breast origin (41 cases); the rest had lung origin (22 cases) and genital origin (14 cases). We have met, too, rare cases with renal and digestive origin metastasis.

In patients with unknown primary tumor the histopathological examination diagnosed the origin of the tumor in 8 cases and in 7 cases gave important information about the presumptive localisation of the primary tumor.

Category: Poster

Titel: Expression and regulation of sprouty isoforms in central and peripheral neurons

Authors: Vallant N.(1), Hausott B.(1), Auer M.(1), Klimaschewski L.(1),

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Abstract:

Expression and regulation of Sprouty isoforms in central and peripheral neurons

Basic fibroblast growth factor (FGF-2) is induced in response to peripheral nerve lesion. FGF-2 activates fibroblast growth factor receptor 1 (FGFR1) and induces axonal growth through sustained MAP kinase activation. Overexpression of FGFR1 enhances axon growth which is further increased by lysosomal inhibition of receptor degradation. Multiple negative feedback regulators such as Sprouty act as inhibitors at different levels of the FGFR pathway thereby attenuating MAP kinase signaling. Sprouty proteins were first identified as antagonists of FGF signaling in *Drosophila* and exhibit four mammalian isoforms.

We analyzed the expression of Sprouty1, -2, -4 by quantitative RT-PCR in peripheral sensory neurons from dorsal root ganglia, central neurons from the hippocampus and the cerebellum, the lung and in C6 glioblastoma, PC12 pheochromocytoma and HeLa cervix carcinoma cell lines. Strong differences in the expression levels were found. The expression of the Sprouty isoforms revealed differences between the peripheral and the central nervous system. Sprouty2 seems to be the main peripheral isoform, whereas Sprouty1 and -4 exhibited the highest expression in central neurons. We analyzed the expression of Sprouty1, -2 and -4 after treatment with FGF-2 or NGF in sensory neurons and PC12 cells. In sensory neurons, all Sprouty isoforms are up-regulated by FGF-2, Sprouty1 and -4 also by NGF. In PC12 cells, Sprouty2 and -4 are strongly up-regulated by FGF-2 and NGF. Taken together our results indicate that the negative feedback regulators Sprouty are highly expressed in neurons and induced by FGF-2 and NGF, respectively.

Category: Poster

Titel: The celiac plexus in South bush rat (*Octodon degus*)

Authors: Nowak E., Kuchinka J., Szczurkowski A., Kuder T. N.(1), Nowak E., Kuchinka J., Szczurkowski A., Kuder T. E.(1),

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Abstract:

Investigations were performed on eight adult individuals of South American bush rats (*Octodon degus*) of either sex. The celiac plexus of four animals were prepared using stereomicroscopy and studied in situ with modified thiocholine method for use in macromorphological specimens. For histochemical investigations tissues from four individuals were cut on 12 µm frozen sections and stained using AChE method and 4-6 µm paraffin histological sections were stained with methylene blue and H&E methods. Histochemical investigations showed that the celiac plexus in investigated species is topographically connected with place where the abdominal aorta gives the ventral splanchnic artery and the mesenteric artery superior. The central part of this plexus is formed by two elongated, triangular or oval ganglia connected each other. They were 2,5-4 mm long and 1,5-2,5 mm wide. Moreover some small additional ganglia connected with postganglionic fibers were observed. Leaving celiac plexus nerve fibers were going along the trunk and branches of the aorta connecting with the other abdominal cavity plexuses. The connections with the mesenteric plexus, splanchnic nerves and branches of vagus nerve were observed.

Histological investigations showed a regularly dispersed ganglionic neurocytes on the surface of the cross-sections. Two biggest agglomerations of cells were contained 165-184 nerve cells. Oval in shape neurocytes had distinct nuclei with one dark and sometimes two nucleoli. The diameter of cells varied from 11,6 µm to 25,2 µm. The nuclei of satellite cells were observed among the neurocytes at the whole surfaces of the cross-sections. The aggregations of neurocytes were surrounded with the 8 µm thickness connective tissue capsule.

Category: Poster

Titel: Increased basal nitric oxide production after chronic alcohol consumption in myenteric neurons of the mouse jejunum

Authors: Torfs P.(1), BAGYANSKI M.(2), VAN NASSAUW L.(3), KRECSMARIK M.(2), VAN OP DEN BOSCH J.(3), FEKETE E.(2), KROESE A.(4), TIMMERMANS J.(3),

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Abstract:

Chronic alcohol consumption (CAC) can lead to intestinal motility disturbances. We previously showed that CAC decreases intestinal transit, probably by affecting nitric pathways. Moreover, immunocytochemistry pointed to a reduction in the relative number of nNOS-expressing myenteric neurons in the murine jejunum. In the present study, we aimed to link these data with optical recordings of myenteric neurons in jejunal whole mounts (WM) of control and ethanol-treated mice.

The ethanol-treated group was given an increasing gradient of ethanol in tap water for 5 weeks, whereas the control group received tap water. Instantaneous NO production by myenteric neurons was visualized in vital jejunal WM, loaded with the NO indicator 4-amino-5-methylamino-2',7'-difluorescein diacetate (DAF-FM).

Although the percentage of nNOS-positive neurons significantly decreased after CAC, the percentage of NO-producing neurons ($\pm 56\%$) remained unaltered. NO production in individual myenteric neurons significantly increased after CAC. In both the control and ethanol-treated group, a significant number of myenteric neurons showed DAF-FM staining although they did not express nNOS, indicating that the observed increase in NO is likely due to other NOS isoforms. Immunocytochemical staining clearly revealed iNOS and eNOS positive myenteric neurons. Preliminary in situ hybridization data are in line with these immunocytochemical data.

We therefore conclude that CAC causes an increase in basal NO production in myenteric neurons. This enhanced NO production appears not to be exclusively due to nNOS, both iNOS and eNOS seem to be involved. This increased NO production might act as a neuroprotective agent, next to its inhibitory effect on intestinal transit.

Category: Poster

Titel: Effects of TGF β -family members on rat ENS neurons in vitro

Authors: Rauch U.(1), Wink E.(2), Hagl C.(2), Schäfer K.(1),

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Abstract:

Purpose: To study the effects of GDNF, Neurturin, Persephin, Artemin as well as TGF β and bFGF alone and in combination on postnatal ENS development in vitro.

Methods: Myenteric plexus from the small intestine as well as from the colon of SPRD-rats of different developmental phases was dissociated and cultivated as mixed cultures of enteric neurons and glial cells either in serum-free medium or in medium containing neurotrophins for different times in vitro. The effects of the neurotrophic factors were evaluated using parameters such as neuronal survival, total neurite length and the number of neurites per cell.

Results: Factors like age, origin of cells (small intestine or colon) but especially synergistic effects of the neurotrophic factors strongly influenced neuronal behaviour in vitro.

Conclusion: This study clearly shows the importance of these neurotrophic factors on rat ENS development in vitro, especially the interaction of various neurotrophic factors, which resembles a bit more the in vivo situation. Concerning this matter we also study these effects while providing diverse microenvironments (3D cultures) at the same time. Last but not least we investigate the effects on the development of different neuronal subtypes.

Category: Poster

Titel: The influence of 3,5,3'-triiodothyronine on neural progenitor cells of the enteric nervous system

Authors: Mohr R.(1), Bareiss P.(1), Skutella T.(1), Just L.(1),

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Abstract:

The thyroid gland hormone triiodothyronine (T3) plays a key role in the regulation of metabolism and growth in developing and adult organisms. Hypothyroidism in newborns leads to cretinism, an irreversible severe mental retardation. Several groups have demonstrated that T3 is involved in cell proliferation and differentiation processes of neural progenitor and postmitotic maturing neurons of the central nervous system. However, little is known about its effects on neural progenitor cells of the enteric nervous system (ENS). In this study, we analysed the influence of T3 on neural progenitor cells from ENS by proliferation assay, immunohistochemistry, Western blot and RT-PCR. Thus, we generated enteric neurospheres from fetal murine and postnatal human gut and cultured them under proliferation and differentiation conditions. Treatment with T3 resulted in an enhanced neurite outgrowth of differentiating neurons in a concentration and time dependent manner but did not affect mitotic activity of neuronal progenitors under proliferation conditions. Our data indicate that the thyroid gland hormone triiodothyronine may be involved in differentiation processes of enteric neurons in the gut.

Category: Poster

Titel:Stromal cell-derived factor-1 mediates dopaminergic neuron survival via cxcr4 in vitro

Authors: Paech T.(1),Strelau J.(1),Unsicker K.(1),Peterziel H.(1),

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Abstract:

Stromal cell-derived factor-1 (SDF-1) as well as its receptor CXCR4 is expressed in dopaminergic neurons of the substantia nigra in the adult rat brain. There, SDF-1 was shown to exert a neuromodulatory action by mediating the release of dopamine. However, there is nothing known about the role of SDF-1/CXCR4 during mesencephalic development.

Purpose: The aim of this study was to examine the role of SDF-1 on the survival of embryonic dopaminergic neurons.

Methods: Survival of E14.5 rat mesencephalic neurons was analysed by counting numbers of tyrosine hydroxylase (TH)+ neurons after 8 days in vitro in the absence and presence of SDF-1 and the CXCR4 specific inhibitor AMD3100. Expression of CXCR4 on dopaminergic neurons was analysed by immunocytochemistry.

Results: Treatment of mesencephalic neurons with SDF-1 significantly increased the number of surviving TH+ cells. This effect could be dose-dependently blocked by inhibition of CXCR4 with AMD3100. In contrast, AMD3100 had no effect on dopaminergic neuron survival on its own.

Conclusions: Our results indicate that the SDF-1/CXCR4 system is involved not only in adult modulatory effects on dopaminergic neurons but might also be important for differentiation and maintenance of these cells during embryonic development.

Category: Poster

Titel:Expression of receptors for the extracellular matrix-associated protein F-spondin in the chicken ciliary ganglion

Authors: Peterziel H.(1),Paech T.(1),Klar A.(2),Unsicker K.(1),

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Abstract:

The extracellular membrane (ECM)-associated protein F-spondin is expressed in non-neuronal cells in the embryonic chicken ciliary ganglion (CG). We have shown previously, that in vitro F-spondin efficiently promotes survival and activation of the disabled-1/Akt-pathway of CG neurons. Moreover, blocking F-spondin function in ovo increases apoptosis during the period of ontogenetic cell death and results in a loss of about 30% of neurons in the CG. The F-spondin protein is processed in vivo to yield an amino half protein, which contains regions of homology to reelin (Reelin/Spondin domain, R/S-domain), and a carboxyl half protein, which contains six thrombospondin type I repeats (TSR). The cleaved products of F-spondin have different properties, i.e. the R/S domain is sufficient to mediate downstream activation of the intracellular signalling pathways, while the survival promoting effect requires TGF-beta activation by the TSR repeats. To further elucidate the mechanism(s) by which F-spondin mediates its effects on CG neurons we analyzed the expression of its putative receptors (members of the LRP-receptor family and amyloid precursor protein) by in situ hybridization and by RT-PCR. We found that APP and LRP2 are expressed on neuronal cells in the CG. We hypothesize that the R/S domain may bind to APP and mediate disabled-1 activation, while LRP2 may sequester the TSR domain and promote TGF-beta activation. Our results suggest that this two-sided binding could explain the requirement of both domains for efficient promotion of CG neuron survival

Supported by GIF G-739-97.1/2002

Category: Poster

Titel:Molecular Characteristics of Classical Proprioceptors and Palisade Endings in Extraocular Muscles of Sheep

Authors: Lay C.(1),Blumer R.(1),

Addresses:(1)Integrative Morphology|Center of Anatomy and Cell Biology, Medical University of Vienna|Vienna|Austria

Poster retracted

Titel:Changes in morphology and immunoreactivity of glial cells during a muscle inflammation.

Authors: Lambertz D.(1),Hoheisel U.(1),Mense S.(1),

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email:uli.hoheisel@web.de

Abstract:

Previous studies had shown that a muscle inflammation leads not only to marked changes in the responsiveness of spinal dorsal horn neurones but also to morphological and functional alterations in spinal astrocytes. In the present experiments, myositis-induced reactions in spinal microglial cells and oligodendrocytes were studied.

In 5 animals, a chronic myositis was induced in the left gastrocnemius-soleus (GS) muscle by injection of complete Freund's adjuvant. After 12 days microglia were visualized in spinal segment L4 by OX-42 immunoreactivity (IR), oligodendrocytes by O4-IR. The immunoreactive (ir) areas, their boundary lengths and the intensity of immunostaining were measured in superficial and deep dorsal horn. Statistical clues were used to differentiate background staining from true IR. 5 naïve rats served as controls.

In myositis animals, the area of OX-42-IR did not change but the surrounding boundary length decreased significantly in the deep dorsal horn. In the superficial dorsal horn there was a myositis-induced significant decrease in O4-ir area and boundary length. During myositis, the intensities of OX-42-IR decreased significantly in all regions of the dorsal horn while that of O4-IR significantly increased.

The data show that microglial cells and oligodendrocytes react with morphological changes to a muscle inflammation. The changes are indicative of glia activation. Microglial cells react mainly with a decrease of boundary length and staining intensity, oligodendrocytes with a decrease in ir area, and an increase in intensity. The decrease in boundary length is probably due to a retraction of the cell processes during activation.

Category: Poster

Titel: Expression of cFos after noxious muscle stimulation in spinal dorsal horn neurones projecting to the PAG

Authors: John, V.(1), Hoheisel, U.(1), Taguchi T.(1), Mense S.(1),

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Abstract:

Purpose: In the rat, neuroanatomic pathways of nociceptive information from a low back muscle (multifidus, MF) at the vertebral level L4 and L5 were compared with that of a hindlimb muscle (gastrocnemius-soleus, GS).

Methods: As a noxious stimulus, 5% formalin was injected into GS or MF. Activated dorsal horn neurones were visualised by their cFos-immunoreactivity (IR) in the spinal segments Th12-L6. To study supraspinal projections, fluorogold (FG) was injected into the contralateral ventrolateral periaqueductal grey (PAG) prior to formalin injection.

Results: Formalin injection into GS or MF caused a strong cFos-IR in all spinal segments investigated. The number of cFos expressing neurones was largest when formalin was injected into MF, the difference to MF being significant in the spinal segments L1, L3, and L4. Most cFos expressing neurones retrogradely labelled from the PAG were located in the superficial dorsal horn. The proportions of projecting (double labelled) neurones were low (GS: 8 %; MF: 6 %). Projecting neurones with nociceptive GS input were found only in lumbar segments, whereas neurones with MF input were evenly distributed over all segments tested.

Conclusions: The results show that dorsal horn neurones processing nociceptive input from GS or MF, respectively, are widely distributed in the spinal cord. Most of them are interneurones or project to supraspinal centres other than the PAG. The cFos data suggest that the synaptic effectivity of nociceptive afferents from MF is greater than that of GS.

Category: Poster

Titel: Expression and regulation of Sef, a novel inhibitor of FGF signaling, in sensory neurons and PC12 cells

Authors: Auer M.(1), Hausott B.(1), Klimaschewski L.(1),

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Abstract:

Fibroblast growth factors (FGFs) are involved in tissue repair in the adult peripheral nervous system. In particular, FGF-2 was shown to promote axonal regeneration via activation of FGF receptor type 1 (FGFR1). FGFR signaling is negatively influenced by intracellular inhibitors like Sprouty and Sef. So far, it is unknown whether Sef is expressed as inhibitor of FGFR activation in the adult peripheral nervous system. Dorsal root ganglia (DRG) obtained from adult rats were dissected and subsequently used for dissociated sensory neuron cultures. Moreover, neuron-like pheochromocytoma (PC12) cells stably over-expressing FGFR1 (short and long splice variant) were used. For detection of Sef mRNA quantitative RT-PCR was used. Histological expression patterns of Sef mRNA transcripts were examined by radioactive in situ hybridisation. Sef was detected in DRG neurons as well as in PC12 cells. Following 4 days of FGF-2 treatment neuronal cultures and PC12 cells revealed a significant increase in Sef mRNA compared to untreated cells. A markedly reduced expression level was observed in DRG neurons transfected with FGFR1 as well as in two different PC12 cell lines overexpressing FGFR1. Addition of FGF-2 resulted in a marked up-regulation of Sef mRNA. Our data indicate that Sef is up-regulated by FGFR1 activation in peripheral neurons corroborating a role of Sef as negative feedback inhibitor and pointing to a novel molecular target to promote peripheral nerve repair. Supported by FWF.

Category: Poster

Titel: The trigeminal nerve – an anatomical survey

Authors: Ivascu R.V.(1), Rusu M.C.(1), Nimigean V.(2), Ciuluvica R.C.(1),

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Abstract:

The skull base anatomy and topography of the trigeminal nerve represents a veritable challenge for clinicians and surgeons. Our aim was to perform an evidence-based anatomical study of the trigeminal nerve in the pontocerebellar angle and the middle cranial fossa, also targeting the cavernous sinus neural content. We used 20 human adult specimens of both sexes (40 sides), fixed and unfixed, and we performed microdissections of the trigeminal roots, ganglion and branches and of the adjoining structures, such as the cavernous sinus elements. Anatomical evidence on these elements and their topographical disposition was obtained and is presented in this paper. The results can be correlated with several studies and discussions are made on the vascular relations of the trigeminal roots, the morphology and topography of the trigeminal ganglion and the complex topography of the cranial nerves directed towards the superior orbital fissure and defined as limits for more than ten topographical triangles that serve to expose distinctive structures during microsurgical procedures. Grant UEFISCSU 317/2007.

Category: Poster

Titel: The superior anterior alveolar nerve and the upper segment of canalis sinuosus of Wood Jones

Authors: Rusu M.C.(1), Nimigean V.(2), Maru N.(2), Ivascu R.V.(1), Ciuluvica R.C.(1),

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Abstract:

The canalis sinuosus is a poorly recognized canal in the anterior wall of the maxillary sinus. References on the topography and morphology of its upper antral segment of that canal are rather poor and impose additional studies. For the present one we used 20 human adult cadavers. We performed antero-lateral, superior and medial approaches of the maxillary sinuses in order to investigate that segment of the sinuous canal. Four types of the proximal segment of the sinuous canal could be defined based upon our preparates: (a) type I – the transantral type; (b) type II – the intramural type; (c) type III – the absent type, with long superior anterior alveolar bundle; (d) type IV – the absent type, with short superior anterior alveolar bundle. These morphological types of the sinuous canal, that are individually possible, must be taken into account when surgical procedures are performed at the level of the maxillary sinus, in order to avoid iatrogenic injuries of the superior anterior alveolar nerve and artery.

Research from grant UEFISCSU 317/01.10.2007

Category: Poster

Titel:Accurate muscle reinnervation and subsequent recovery of motor function after facial nerve injury require insulin-like growth factor 1 (IGF-I)

Authors: Kiryakova S.(1),Grosheva M.(2),Schuetz U.(3),Soenchen J.(1),Marinova T.(4),Angelova S.(2),Angelov D.(1),

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Abstract:

Recently we reported that the degree of functional recovery after facial nerve transection (FFA) correlated with the portion of poly-innervated neuro-muscular junctions (NMJ). Whereas the cellular correlates of poly-innervation are well established – the terminal Schwann cells (TSC) grow out cell processes, attract axons and thus connect ("bridge") adjacent NMJ causing a pathological cross talk ("kurzschluß") – the molecular correlates of TSC sprouting are poorly understood. Since denervated muscles are known to produce short-range diffusible nerve sprouting stimuli, most of which have been identified as growth factors, we decided to prove the role of IGF-I. Apart from promoting neurite regrowth, it is the only trophic factor that has been repeatedly reported to control Schwann cell viability and thus improve muscle regeneration after nerve injury. Following FFA, we studied (i) recovery of vibrissal motor performance (video-based motion analysis) and TSC sprouting activity in the levator labii superioris muscle (percentage of NMJ bridged by S100-positive TSC) in mice deficient in the expression of IGF-I (stock Igf1tmTs/ImJ, Nr. 003258, Jackson Laboratories). Wildtype (WT) littermates of the IGF-I deficient mice, we used as controls. We found that 2 months after FFA the amplitude of vibrissae whisking in the WT-mice was reduced to 50% of the value measured in intact mice and the portion of bridged NMJ was 8%. In the IGF-I-deficient mice, the amplitude remained reduced to 40% and the bridged NMJ comprised 13%. These differences let us conclude that IGF-I is necessary for re-establishment of target muscle reinnervation. *Supported by the Jean-Uhrmacher Foundation

Category: Poster

Titel: Recovery of vibrissal motor performance after facial nerve repair requires brain-derived neurotrophic factor (BDNF)

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Abstract:

It has been recently established that functional recovery after facial nerve repair (facial-facial anastomosis, FFA) correlates with the portion of poly-innervated neuro-muscular junctions (NMJ). Whereas the cellular correlates of poly-innervation are well established – the terminal Schwann cells (TSC) grow out cell processes, attract axons and thus connect (“bridge”) adjacent NMJ causing a pathological cross talk (“kurzschluß”) – the molecular correlates of TSC sprouting are poorly understood. Since denervated muscles are known to produce short-range diffusible nerve sprouting stimuli, most of which have been identified as growth factors, we decided to prove the role of BDNF. This neurotrophin has been shown to effectively promote axonal regrowth. Following FFA, we studied (i) recovery of vibrissal motor performance (video-based motion analysis) and TSC sprouting activity in the levator labii superioris muscle (percentage of NMJ bridged by S100-positive TSC) in mice deficient in the expression of BDNF (strain B6.129S4-Bdnftm1Jae/J, Nr. 002267, Jackson Laboratories). Wildtype (WT) littermates of the BDNF-deficient mice were used as controls. We found that 2 months after FFA the amplitude of vibrissae whisking in the WT-mice was reduced to 50% of the value measured in intact mice and the portion of bridged NMJ was about 20%. In the IGF-I-deficient mice, the amplitude remained reduced to 35% and the bridged NMJ were again 20%. These differences let us conclude that BDNF is necessary for rapid neurite regrowth after surgery.

Category: Poste

Titel:Stabilization of microtubules with taxol Improves quality of muscle reinnervation and recovery of function after facial nerve repair in rats

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Abstract:

Within a recent study on the recovering vibrissae motor performance after facial nerve repair in blind (strain SD/RCS) and sighted (strain SD) rats we found that, despite persisting myotopic disorganization in the facial nucleus, the blind animals fully restored vibrissal whisking. Searching for the morphological substrates of this better recovery we compared the amount of cytoskeletal proteins in the leading edge of elongating axons between both strains. Since our results showed an enhanced expression of neuronal class III β -tubulin in the blind rats, we wondered whether this was due to an increased synthesis or to a delayed turnover of microtubules. In the present report we approached this question applying established pharmacological agents to perturb microtubule assembly towards stabilization (enhanced polymerization with 10 μ g/ml taxol) or increased synthesis (challenged by destabilization with 100 μ g/ml nocodazole and 20 μ g/ml vinblastine) to the transected buccal branch of the facial nerve in sighted Wistar rats. Evaluation of the effect(s) two months later included estimations of (i) vibrissae motor performance by video-based motion analysis, (ii) degree of collateral axonal branching by double retrograde neuronal labeling with crystals of Fluoro-Gold and Dil and (iii) pattern of motor end-plate re-innervation (proportions of mono- and poly-reinnervated) in the largest extrinsic vibrissal muscle, the levator labii superioris. We found that only stabilization of microtubules with 10 μ g/ml taxol reduced the intramuscular axonal sprouting and the polyinnervation of the motor end-plates. This was accompanied by improved restoration of function.

Category: Poster

Titel: Manual stimulation of the suprahyoid-sublingual region diminishes polynnervation of the motor end-plates and improves recovery of function after hypoglossal nerve injury in rats

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Abstract:

BACKGROUND: Using the rat facial nerve axotomy model, we recently showed that manual stimulation (MS) of denervated whiskerpad muscles reduced the post-transectional poly-innervation at the neuro-muscular junctions (NMJ) and promoted full recovery of vibrissal whisking. **OBJECTIVE:** Prompted by implications for rehabilitation therapy, we examined whether MS of denervated suprahyoid-sublingual region would also improve recovery after unilateral lesion on the hypoglossal nerve. **METHODS:** Adult female rats underwent transection and suture of the right hypoglossal nerve. Half of the animals received no post-operative treatment, and the other half were subjected to daily MS of the suprahyoid/sublingual region for 2 months. Recovery was assessed by measuring of (i) the angle of tongue-tip deviation from the midline, (ii) the degree of collateral axonal branching at the lesion site (neuronal counts after double retrograde labeling with two fluorescent dyes), (iii) the tongue-muscles motor representation in the cerebral cortex after c-Fos immunocytochemistry, and (iv) the portion of poly-innervated NMJ. **RESULTS:** In animals receiving MS, the tongue-tip deviation was $37.04 \pm 9.37^\circ$; whereas values in control non-stimulated rats were significantly higher ($50.1 \pm 9.01^\circ$; $p < 0.05$; mean \pm S.D.; $n = 26$ per group). Improved recovery was not associated with reduced collateral axonal branching, there were also no differences in tongue-muscles representation in the motor cortex. However, the proportion of poly-innervated NMJ was reduced in stimulated compared to non-stimulated animals ($18 \pm 7\%$ versus $32 \pm 12\%$; $p < 0.05$). **CONCLUSION:** Taken together, our data show that MS of denervated muscles improves functional outcome following peripheral nerve injury. This suggests immediate potential for enhancing clinical rehabilitation strategies

Category: Poster

Titel:Improved eye closure after facial nerve repair and manual stimulation of the orbicularis oculi muscle in rats

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Abstract:

Motor disabilities after peripheral nerve injury are attributed to excessive axonal sprouting and poly-innervation of the neuro-muscular junctions (NMJ). Since it is known that mechanical stimulation (MS) of denervated muscles reduces intramuscular sprouting, we proved whether MS of m. orbicularis oculi (MOO) would diminish poly-innervation and improve recovery of eye closure. Following transection and suture of the right facial nerve (FFA) in 20 rats, half of the animals received daily gentle manual support for the eye-closure. After two months, the blink capacity was estimated using a standardized air-puff to the cornea. Employing video-based motion analysis, we measured the mean distance between both eyelids after 10 sequential air puffs. In intact rats it was 0.2 ± 0.01 mm. Thereafter we studied the pattern of NMJ reinnervation in frontal sections through MOO. Intramuscular axons were visualized with anti-neuronal class III beta-tubulin and the NMJ with Alexa Fluor 488-conjugated alpha-bungarotoxin. Quality of end-plate reinnervation (mono- or poly-) was evaluated by the number of axonal branches that enter the boundaries of each individual NMJ. Daily MS improved the pattern of reinnervation and eye-closure function. Two months after FFA the portion of poly-innervated NMJ was 21% in the non-stimulated rats and 14% in the stimulated animals. After FFA-alone the mean distance between both eyelids was 2.6 ± 0.07 mm in non-stimulated rats, but 1.6 ± 0.1 mm in rats subjected to daily MS. Thus the MS significantly improved the post-operative recovery of eye-closure, a finding with immediate potential for enhancing clinical rehabilitation strategies.

Category: Poster

Titel:Manual stimulation of forearm muscles does not improve recovery of motor function after injury to a mixed peripheral nerve

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Abstract:

Transection and re-anastomosis of the purely motor facial nerve leads to poor functional recovery. However, we have recently shown in rat that, manual stimulation (MS) of denervated vibrissal muscles reduces the number of polyinnervated motor end-plates and promotes full recovery of whisking. Here we examined whether MS of denervated rat forearm muscles would also improve recovery following transection and suture of the mixed (sensory and motor) median nerve (median-median anastomosis, MMA). Following MMA of the right median nerve, animals received no post-operative treatment, daily MS of the forearm muscles or handling only. An almost identical level of functional recovery, measured by the force of grip in grams, was reached in all animals by the sixth post-operative week and maintained till 3 months after surgery regardless of the postoperative treatment. Also, we found no differences among the groups in the degree of axonal sprouting, the extent of motor endplate polyinnervation and in the soma size of regenerated motoneurons. Taken together, we show that while MS is beneficial following motor nerve injury, combined strategies will be required for functional recovery following mixed nerve injury.

Category: Poster

Titel: Donor nerve grafts in upper limb: histological and morphometric characteristics

Authors: Altun U.(1), Ucar Y.(1), Sarikcioglu L.(1), Gokhan G.(2), Gurer I.(2),

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Abstract:

Purpose: To study histologic and morphometric characteristics (axon number, number of fascicles, total area of the connective tissue, cross-sectional area) of the donor nerve grafts in the upper extremity.

Methods: A total number of eight donor nerves (lateral antebrachial cutaneous nerve, medial antebrachial cutaneous nerve, medial brachial cutaneous nerve, posterior brachial cutaneous nerve, posterior interosseous nerve, anterior interosseous nerve, superficial branch of the radial nerve, superficial branch of the ulnar nerve) of 13 cadavers were included to the present study. Routine histological tissue processing methods were done. Cross sections of the graft samples were analyzed by image analysis system.

Results: Comparison of the data revealed that each nerve has specific characteristics.

Conclusions: We suggest that these histological and morphometric characteristics of the donor nerves should be remembered during selection of the appropriate donor nerve for reconstruction of recipient nerve in the upper limb.

Category: Poster

Titel:Anatomic variation of the median nerve and clinical significance

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Abstract:

We present a rare variation of median nerve with possible clinical significance. During the dissection classes in the Department of Anatomy at University of Medicine and Pharmacy \"Carol Davila\" Bucharest, few cadavers showed anatomic variations relates to the \"delayed\" contribution of the lateral cord. At the dissection of few cadavers, the lateral cord it is very small, but the musculocutaneous nerve sends a branch to the median nerve in the proximal arm. The medial and lateral cords can pass posterior to the axillary artery to form the median nerve (1 case), which subsequently takes a posterior course to reach the medial aspect of the brachial artery. Compression of the median nerve in the arm is often caused by vascular structures because the nerve has an intimate relationship with brachial vessels.

The clinical significance of the variation may be important because symptoms of median nerve compression arising from similar variations are often confused with more common causes such as radiculopathy and carpal tunnel syndrome often overdiagnosed, misdiagnosed, or incompletely diagnosed. Many patients with carpal tunnel syndrome have been found to have nerve compression at a higher, more proximal level, such as the elbow.

Category: Poster

Titel: Impact of neurolysis, nerve transposition and epicondylectomy on the physiology and morphology of the scarred ulnar nerve during mechanical distraction of the elbow joint in rabbits

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Abstract:

Mechanical expansion of articular clefts (distraction arthrolysis, DA) is an established approach to treat post-traumatic joint stiffness. During DA of the elbow joint, however, special care has to be taken of the ulnar nerve, which can be damaged. Three techniques to avoid ulnar nerve injury are used: neurolysis, nerve transposition and epicondylectomy. The aim of the present study was to prove which method ensures best nerve preservation. Rabbit left ulnar nerve was exposed and sutured to the surrounding soft tissue. After 4 weeks (to allow for scarring) a controlled DA of the joint cleft (to 5 mm) was performed. Prior to DA rabbits underwent either neurolysis, anterior transposition or medial epicondylectomy. Thereafter we determined nerve distension (using optical markers placed along the nerve in equidistant reference points), nerve conduction velocity (NCV) and the number of motoneurons and dorsal root ganglion (DRG) cells after retrograde labeling with Fast Blue (FB). The analysis of nerve distension showed significant site-specific changes after transposition and epicondylectomy, but not after neurolysis. NCV in intact rabbits was 68 ± 12 m/s. It remained unaltered in the neurolysis group (60 ± 10 m/s) but dropped significantly to 40 ± 15 m/s and 36 ± 11 m/s after transposition and epicondylectomy respectively. The number of retrogradely labeled motoneurons and DRG-cells was not altered in the neurolysis group, but significantly lower after transposition and epicondylectomy. Our results indicate that neurolysis of the scarred ulnar nerve during DA of the elbow joint is the method of choice.

Category: Poster

Titel: Morphological changes of the sciatic nerve in genetically obese (ob/ob) mice are associated with altered endoneural microvessels

Authors: Nowicki M.(1), Schmidt W.(1), Wagner M.(1), Punkt K.(1), Kosacka J.(1), Ruschke K.(2), Blüher M.(3), Spaniel-Borowski K.(1),

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Abstract:

Purpose: Deficits in conduction velocity have been shown in the sciatic nerve of ob/ob mice by others. The current study aimed to detect morphological changes in the sciatic nerve in ob/ob mice compared to lean mice. Mice on a high fat diet were included.

Methods: Metabolic parameters to verify the prediabetic stage in the three mice groups and morphological studies of the sciatic nerve and of skeletal muscle fibers were conducted.

Results: Serum parameters revealed the prediabetic stage of the four-month-old ob/ob mice. In the sciatic nerve, the longitudinally cut nerve fibres showed a higher number of Ranvier nodes per 0.033 mm² area in both obese groups compared to lean mice. In ultrathin sections of ob/ob mice, the thickness of a cross cut myelin sheath was significantly reduced in fibres up to 10 µm in axonal diameter. This finding corresponded to thickening of the basal membrane in endoneural vessels, and to vasodilatation of capillaries. The muscle fibre analysis revealed a fast-to-slow fibre transformation in the Soleus as endurance muscle, the Extensor digitorum longus and the Tibialis anterior as fast-force muscles of the obese groups. The high fat diet mice developed the described morphological changes in the sciatic nerve and the skeletal muscles at a lower degree.

Conclusions: Our results indicate quantitative changes in the sciatic nerve fibres of prediabetic ob/ob mice, which are associated with endoneural microvessel dysfunctions. A reduced endoneural blood flow might likely cause the very early stage of peripheral diabetic neuropathy. IZKF project B24.

Category: Poster

Titel:Effect of wide and narrow stripping of the vasa nervorum in rat sciatic nerve: the role of muscular perforators

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Abstract:

Purpose: Peripheral nerve trunks are well-vascularized structures where a well-developed collateral system may compensate for local vascular damage. In the present study, we aimed to study neovascularization after stripping of the vasa nervorum.

Methods: A total number of 40 male rats were used for this study. The animals were divided into four groups (Control, Sham, Group 1, Group 2). In Group 1, epineurial vessels contributing to the formation of the vasa nervorum were stripped approximately one cm in length (narrow stripping). However, in Group 2, the epineurial vessels were stripped approximately two cm in length (wide stripping). Neovascularization of the sciatic nerve was examined by seven days interval using a stereomicroscope.

Results: In Group 1, neovascularization was originated from branches of the new longitudinal vessels. However, in Group 2, in addition to new longitudinal arteries, muscular perforators contributed to the supply of the sciatic nerve and gave new vessels around the sciatic nerve.

Conclusion: We conclude that wide stripping resulted severe damage in the sciatic nerve and therefore new vessels adjacent muscular vessels contributed to supply of the sciatic nerve.

Category: Poster

Titel:Contribution of the popliteal artery to supply sciatic nerve in rat

Authors: Sarikcioglu L.(1),Demirel B.(1),Utuk A.(1),Yildirim F.(1),

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Abstract:

Purpose: The nutrient arteries supplying the peripheral nerves came from either the adjacent axial artery or the fasciocutaneous or muscular arteries. They formed anastomotic channels in the epineurium and penetrated it to form a continuous longitudinal artery. In the present study we aimed to study vascular patterns of rat sciatic nerve.

Methods: Vascular supply of the rat sciatic nerve from the popliteal artery was studied on 25 rats. The sciatic nerve was approached by splitting of the gluteal and femoral muscles. The sciatic nerve vascularization was examined by using a stereomicroscope with fiber optic illumination.

Results: We found that the rat sciatic nerve had four different patterns. The patterns were: as a muscular perforator artery and an axial artery (Type 1), as an axial artery ramified at proximally (Type 2), and as an axial artery ramified at distally (Type 3), as a thin axial artery and thick muscular perforator (Type 4).

Conclusions: We think that such vascularization patterns should be kept in mind in peripheral nerve surgeries and understanding of the vasculitic neuropathies.

Category: Poster

Titel: Reduced nuclear protein transport, altered protein dynamic and dysmorphic nuclei associate with a lamin A mutant causing restrictive dermopathy

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Abstract:

Lamins are members of the family of intermediate filaments (IF). Unlike other IF proteins, they localize exclusively in the nucleus where they form the lamina and an intranuclear scaffold. The A-type lamin, lamin A, has received much attention as mutants thereof cause a wide spectrum of diseases (laminopathies). Lamin A is synthesized as a precursor protein that matures in a multistep process. As a karyophilic protein lamin A contains a nuclear localization sequence (NLS). We investigated the impact that laminopathy-causing mutants with altered NLS-function or maturation have on nuclear morphology, subcellular localization and protein dynamics using dsRed fusions of the lamin A mutants LaAR419C (NLS-mutant causing partial familial lipodystrophy) and LaDelta90 (maturation-mutant causing restrictive dermopathy). We found assembly of LaAR419C in the cytoplasm but to some extent also in the nuclear lamina. Expression of LaAR419C together with lamin A-binding proteins revealed in some cases cytoplasmic colocalization, in other mutually independent subcellular distribution. Simultaneous expression with GFP-lamin A did not prevent LaAR419C from cytoplasmic assembly. Expression of LaDelta90 resulted in the formation of dysmorphic nuclei. This phenotype could be rescued by treating LaDelta90-expressing cells with lovastatin (inhibits maturation), but not through coexpression of a nuclear aggregating lamin A mutant. We also observed reduced lamina-dynamics for LaDelta90 compared to lamin A. Conclusion: The overexpression of new lamin A mutants will further expand our knowledge regarding the pathogenesis of laminopathies and will provide new cellular models to study the impact such mutants have on general nuclear signalling processes.

Category: Poster

Titel: Mistargeting of peroxisomal proteins into distinct subcellular compartments in peroxisomal biogenesis disorders: PEX19-KO mice as a new model system

Authors: Beck A.(1), Richter E.(1), Morrell J.(2), Okun J.(3), Gould S.(2), Baumgart-Vogt E.(1),

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Abstract:

In man malfunction or absence of peroxins, proteins regulating the biogenesis of peroxisomes, leads to the devastating diseases of the Zellweger Syndrome spectrum. Normally the peroxin 19 protein (Pex19p) is involved as a cytoplasmic chaperone and shuttling receptor in the import of peroxisomal membrane proteins. Fibroblasts of patients with Pex19p-deficiency are supposed to lack detectable peroxisomal membranes. We have generated the first knockout mouse model to study peroxisomal membrane biogenesis by deletion of the PEX19 gene (exons 2-6). Similarly to Zellweger patients, PEX19(-/-) pups are growth retarded, hypotonic and die during the first postnatal days. In hepatocytes and fibroblasts of PEX19(-/-) animals no peroxisomes are detectable with markers for peroxisomal membrane (Pex13p/Pex14p/ABCD3) or matrix (catalase/PTS1-proteins/thiolase) proteins. Peroxisomal matrix proteins are mislocalised to cytoplasm and nucleus or are detectable in large autophagic vacuoles. The peroxisomal membrane proteins Pex13/Pex14p are mislocalised to mitochondria and ABCD3 is completely degraded. In electron-microscopic preparations loop- or whorl-like membrane structures, suggestive for peroxisomal "membrane ghosts", are visible in glycogen areas of hepatocytes, where peroxisomes are normally observed in wild-type animals. Mitochondria are proliferated and show structural alterations together with elevated SOD2-levels, suggestive for increased ROS production. Autophagic vacuoles often contained mitochondria as well as very long chain fatty acid (VLCFA)-crystals. Due to malfunction of peroxisomal beta-oxidation in these mice, accumulation of VLCFAs was also observed biochemically in blood and liver tissue. Overall, Pex19p-deficient mice are an optimal model system to study peroxisomal biogenesis disorders.

Category: Poster

Titel: Strong alterations of the peroxisomal compartment during osteoblast differentiation and osteocyte development

Authors: Qian G(1), Baumgart-Vogt E(1),

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Abstract:

Patients with peroxisomal diseases display defects in desmal and enchondral ossification processes. However, only sparse information is available on the function of peroxisomes in osteoblasts. Therefore, we characterized the peroxisomal compartment in this cell type by means of 1) isolation and culture of primary osteoblasts from the calvaria of newborn mice (P0.5) 2) double-immunofluorescence stainings of cultivated osteoblasts with marker antibodies for osteoblast differentiation and peroxisomal proteins 3) RT-PCR and Western blots for investigating the expression levels of "peroxisome-related" genes and proteins. Immunostainings for Pex14p, a peroxisomal biogenesis protein, revealed that peroxisomes proliferated between day 3 and 7 in cultivated osteoblasts. Moreover, tubular peroxisomes were observed more frequently in later stages of osteoblast differentiation. RT-PCR and Western blot results revealed low levels of most mRNAs and corresponding peroxisomal proteins in 3d-osteoblasts. Their expression levels and protein content were significantly increased in 7d- and 11d-osteoblasts. In later stages (15d) of osteoblast cultures, in which mineralization was strong and osteocytes developed, mRNA-expression levels and protein content for peroxisomal matrix enzymes, such as catalase and peroxisomal beta-oxidation enzymes were dramatically decreased, suggesting cyclic variations of peroxisomal metabolic enzymes during ossification. However, biogenesis proteins of the peroxisomal membrane (Pex13p and Pex14p) were only present at low levels at day 3, reached a plateau at 7 days and showed no significant alterations at later stages. Taken together, our data suggest that the peroxisomal compartment is strongly affected and altered during osteoblast differentiation and may play an important role in the metabolic functions of mature osteoblasts.

Category: Poster

Title: Pathological consequences of peroxisome-dysfunction in the lung

Authors: Karnati S, Baumgart-Vogt E(1),

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No abstract available

Titel:Clara-like cells are selectively activated by stimulated ATP release from pulmonary neuroepithelial bodies

Authors: De Proost I.(1),Pintelon I.(1),Wilkinson W.(2),Goethals S.(1),Brouns I.(1),Van Nassauw L.(1),Riccardi D.(2),Timmermans J.(1),Kemp P.(2),Adriaensen D.(1),

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Abstract:

The neuroepithelial body (NEB) microenvironment consists of intraepithelial groups of neuroendocrine cells that receive an extensive innervation and are shielded from the airway lumen by a special type of Clara cells, the so-called Clara-like cells. We have recently shown that NEB cells, visualized in ex vivo mouse lung slices, respond with a $[Ca^{2+}]_i$ rise to stimulation with high K^+ , followed by a delayed $[Ca^{2+}]_i$ increase in Clara-like cells, indicative of an indirect activation. Our aim was to explore the mechanism of this potential interaction between NEBs and Clara-like cells. We focused on a possible purinergic signaling pathway, because NEB cells are known to accumulate ATP as a neurotransmitter.

Using 'sniffer patching' to detect ATP release, stimulation with high K^+ was shown to elicit quantal ATP release from NEBs. Use of enhanced ATP hydrolysis and the general P2 receptor blocker suramin confirmed that ATP was responsible for activating Clara-like cells following application of high K^+ . A combined pharmacological and Ca^{2+} imaging approach further revealed the involvement of functional P2Y2 receptors, and immunohistochemistry verified the expression of P2Y2 receptors on Clara-like cells.

In conclusion, stimulation of pulmonary NEBs in ex vivo lung slices evokes Ca^{2+} -mediated release of ATP that subsequently selectively activates the surrounding Clara-like cells in the NEB microenvironment, which recently has been assigned a potential pulmonary stem cell niche.

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Category: Poster

Titel:Microvessels and leukocytes in lung tumors of SP-C/c-raf transgenic mice

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Abstract:

Purpose: SP-C/c-raf transgenic mice develop lung tumors. Whether leukocytes and microvessels alter in density from small lesions to large cancerous nodules, is unknown.
Methods and Results: 3-13-month-old transgenic mice with different stages of lung tumor malignancy were studied in comparison to controls. Lungs were immunostained for microvessels (CD34), and for leukocyte antigens (CD44, CD45). CD34 staining showed similar microvessel density in different tumor stages. Late stage tumors organized around a big venule similar to a liver nodule around the central vein. We demonstrated a statistically significant correlation between tumor growth and increase of CD44 positive (CD44+) and CD45+ cells in the transgenic mice. According to co-localization data, more CD44+ leukocytes than CD45+ ones were found often in aggregates outside the tumor. Yet only CD44+ cells were present within large-sized tumors.
Conclusions: Because CD44, a receptor for hyaluronic acid, is known to be overexpressed during invasiveness and metastasis, the CD44+ cells within a nodule supposedly are tumor cells of high malignancy.

Category: Poster

Titel: cAMP via Epac/Rap 1 activates Rac 1 in microvascular endothelium in vitro

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Abstract:

It is well established that cAMP stabilizes endothelial barrier functions, in part by regulation of VE-cadherin via EPAC/Rap 1. We found that cAMP prevented inactivation of Rac 1 which is also important for barrier maintenance. The aim of the present study was to investigate whether cAMP and Rap1 activate Rac 1 in microvascular endothelium. In human dermal microvascular endothelial cells (HDMEC), increase of cAMP by forskolin/rolipram (F/R) as well as the Epac/Rap 1-stimulating cAMP analogue 8-pCPT-2'-O-Methyl-cAMP (O-Me-cAMP) stabilized endothelial barrier properties as revealed by raised transendothelial electrical resistance (TER). Under these conditions, immunostaining of VE-cadherin and claudin 5 were increased and linearized. This was paralleled by a activation of Rac 1 by $153 \pm 16 \%$ (F/R) or $281 \pm 65 \%$ (O-Me-cAMP) whereas activity of Rho A was unchanged. F/R and O-Me-cAMP, similar to the Rac 1-activating toxin CNF-1, increased the peripheral actin belt and recruited the Rac 1 effector cortactin to cell junctions. Thrombin was used to further test the physiologic relevance of cAMP-mediated Rac 1 activation. Thrombin-induced drop of TER was paralleled by intercellular gap formation, inactivation of Rac 1 and activation of Rho A at 5 min and 15 min whereas baseline conditions were re-established following 60 min. Both, F/R and O-Me-cAMP completely blocked the thrombin-induced barrier break-down. F/R completely abolished thrombin-induced Rac 1 inactivation and Rho A activation whereas O-Me-cAMP only partially blocked Rac 1 inactivation. These results indicate that Rac 1 activation likely contributes to the barrier stabilizing effects of cAMP in microvascular endothelium.

Category: Poster

Titel:Physiological hydrostatic pressure protects endothelial monolayer integrity by caveolin-1-dependent mechanisms

Authors: Müller-Marschhausen K.(1),Drenckhahn D.(1),Waschke J.(1),

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Abstract:

Endothelial monolayer integrity is required to maintain endothelial barrier functions and has found to be impaired in several disorders like inflammatory edema, allergic shock or arteriosclerosis. Under physiologic conditions in vivo, endothelial cells are exposed to mechanical forces such as hydrostatic pressure, shear stress and cyclic stretch. However, the insight in the effects of hydrostatic pressure on endothelial cell biology is very limited at present. Therefore, in this study we tested the hypothesis that physiologic hydrostatic pressure protects endothelial monolayer integrity in vitro. We investigated the protective efficacy of hydrostatic pressure in microvascular myocardial endothelial (MyEnd) cells and macrovascular pulmonary artery endothelial cells (PAEC) by application of selected pharmacological agents known to alter monolayer integrity in the absence or presence of hydrostatic pressure. In both endothelial cells lines, extracellular Ca²⁺-depletion by EGTA was followed by a loss of VE-cadherin immunostaining at cell junctions. However, hydrostatic pressure (15 cmH₂O) blocked this effect of EGTA. Similarly, cytochalasin D-induced actin depolymerization and intercellular gap formation, cell detachment in response to the Ca²⁺-calmodulin antagonist trifluperazine (TFP), as well as thrombin-induced cell dissociation were also reduced by hydrostatic pressure. Moreover, hydrostatic pressure significantly reduced the loss of VE-cadherin-mediated adhesion in response to EGTA, cytochalasin D and TFP in MyEnd cells as determined by laser tweezer trapping using VE-cadherin-coated microbeads. In caveolin-1-deficient MyEnd cells that lack caveolae, hydrostatic pressure did not protect monolayer integrity compromised by EGTA indicating that caveolae-dependent mechanisms are involved in hydrostatic pressure sensing and signalling.

Category: Poster

Titel:SARMs (Selective Androgen Rezeptor Modulator) influences vessel development

Authors: Schmidt A.(1),Richarz N.(1),Thevis M.(2),Thevis M.(2),Kamber M.(3),Geyer H.(2),Schänzer W.(2),Bloch W.(1),

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Abstract:

Anabolic drugs are the most often detected doping in athletes. A new high potential group of drugs which were originally developed for therapeutic purposes are the so called "selective androgenic receptor modulators" (SARM). Present these compound are not available on the regular market. But because of their high potency an abuse can be expected in the near future. Potential side effects caused by SARMs are unknown. Within this study we examined the effect of Arylpropionamid-based SARMs to vasculogenesis. We used mouse embryonic bodies (EB) generated by the embryonic stem cells line D3. The EBs were treated for different durations with SARMs. By using fluorescence immunohistochemical staining we analyzed the quantity and quality of vasculogenesis under the use of confocal laser scanning microscopy. Also the influence to apoptosis and proliferation were analysed. We had found various effects onto vasculogenesis caused by SARMs. These effects were depended to the duration of SARMs incubation. Summarising we can reason that SARMs have the opportunity to influence vessel development.

Category: Poster

Titel:Lactate influences vasculogenesis

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Abstract:

Lactate or Lactic acid, also known as milk acid, is a chemical compound that plays a role in several biochemical processes. During power-intensive exercises such as sprinting, when the rate of demand for energy is high, lactate is produced faster than the ability of the tissues to remove it and lactate concentration begins to rise. In newer times Lactate became discussed also to influence endothelial behavior. It was shown that lactate influences the migratory activity of endothelial cells via increasing the VEGF production within these cells. Wound healing and tissue regeneration is directly associated with endothelial migration which is necessary for angiogenesis. Up to now it is unknown if lactate also occurs the ability to influence vasculogenesis.

We used mouse embryonic bodies (EB) generated by the embryonic stem cells line D3. The EBs were treated for different durations with lactate. By using fluorescence immunohistochemical staining we analyzed the quantity and quality of vasculogenesis under the use of confocal laser scanning microscopy. Also the influence to apoptosis and proliferation were analysed. We had found various effects onto vasculogenesis caused by lactate. These effects were depended to the duration of lactate incubation.

Summarising we can reason that lactate has the opportunity to influence vessel development.

Category: Poster

Titel: Selective loss of hypoxic pulmonary vasoconstriction of murine intra-acinar arteries in cultured precision-cut lung slices

Authors: Grósz A.(1), Paddenberg R.(1), Pfeil U.(1), Kummer W.(1),

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Abstract:

Hypoxic pulmonary vasoconstriction (HPV) matches ventilation to perfusion by diverting blood flow to better ventilated areas of the lung. Previously, we showed that precision-cut murine lung slices (PCLS) are suitable to study HPV of intra-acinar arteries (IAA) and that mitochondrial complex II is among the candidates serving as the primary oxygen sensor. In an attempt to extend this model for long-term experimental approaches (e.g. siRNA), PCLS were cultured for 2–72 h before analysis. Unexpectedly, HPV of IAA was selectively lost after 24 h in normoxic (21% O₂) and hyperoxic (95% O₂) culture, whereas the response to a thromboxane analogue (U46619) remained unaffected. Since the loss of HPV might be caused by altered gene expression of the mitochondrial complex II subunits (SDH-A, -B, -C, -D) fresh and cultured PCLS and laser-microdissected IAA were subjected to quantitative RT-PCR. Expression of each SDH subunit was significantly decreased in the whole PCLS, but not in microdissected IAA. SDH-A protein expression was analyzed by Western Blotting and densitometry. It was significantly decreased in PCLS cultured under hyperoxia for 24 h, compared to those kept under normoxia. Histochemical detection of SDH enzyme activity showed reduced activity in the airways of cultured PCLS, whereas no alteration was detected in the IAA.

These data demonstrate that cultured PCLS can serve as a model to screen for oxygen sensor candidates. The selective loss of HPV of IAA in slice cultures is not caused by reduced mRNA and protein expression of mitochondrial complex II subunits. (SFB 547, C1)

Category: Poster

Titel:Which influence do the current status of training and hypoxia have on human mesenchymal stem cells?

Authors: Schmidt A.(1),Meinecke E.(1),Wahl P.(2),de Mareés M.(2),Mester J.(2),Bloch W.(1),

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Abstract:

In the past it was shown that after physical exercise stem cells are increased in the circulation. We were able to show that a short intensive physical exercise leads to an increased mobility of MSC. However unclear is which effect hypoxia and the current status of training have on MSC. Therefore during this study the effects on MSC were analysed after exposure under hypoxia. Here fore we isolate human MSC from bone marrow of patients that undergo a hip operation. Following the MSC were cultured and were treated with sera of the volunteers (5 athletes/3 non-athletes) 3 days before, 4 days after and 5 weeks after training in hypoxia and residence under hypoxia respectively.

All in all 5 volunteers performed training under hypoxia whereas the control group only stayed under hypoxia. After the treatment of MSC with sera the migration behaviour as well as proliferation and apoptosis was analysed.

As result we observed a significant increase in the migration of MSC for the athletes compared to the non-athletes. Whereas for the non-athletes a significant increase in proliferation was observable. In addition a significant increased apoptosis was seen for MSC treated with sera of athletes after training under hypoxia. Also 5 weeks after training under hypoxia the athletes showed a significant higher apoptosis compared to the non-athletes. Summarising it can be reason that the sera of the athletes induce a higher mobility of MSC. But training under hypoxia has a negative effect on the apoptosis of MSC.

Category: Poster

Titel:Fibrin Glue: in combination with human mesenchymal stem cells a suitable scaffold for Cartilage Tissue Engineering in vitro?

Authors: Baumgartner L.(1),Arnhold S.(2),Addicks K.(3),Bloch W.(1),

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Abstract:

The purpose of this study was to create a matrix which provides a suitable scaffold for reimplanting cells, minimizing necrotic areas and maintaining cell-proliferation as well as their capacity to develop a chondrogenic character.

Therefore, pluripotent stem cells, isolated from adult human bone marrow (hMSC), were integrated into fibrin sealant (Tissucol, Baxter) and cultured either in proliferation medium or under conditions of chondrogenic differentiation for 21d in vitro. Applying centrifugal forces, we were able to create a new large-porous fibrin matrix. We compared culture conditions under normoxia (21%O₂) and hypoxia (3%O₂).

The hMSC integrated into the fibrin matrix were analyzed with regard to morphology, proliferation and pluripotency, especially concerning their capacity to adopt a chondrogenic character. Morphology and proliferation did not markedly vary concerning normoxia and hypoxia, but noteworthy proliferation could still be detected after 21days in culture. In addition we observed rounded chondrocyte-like cell types in the fibrin constructs cultured under differentiation. Using RT-PCR we could show that the hMSC retain their pluripotency through expression of transcription factor Oct-4 during the whole culture period.

Furthermore, under chondrogenic differentiation, we were able to detect a gradient chondral phenotype assessed by mRNA expression of collagen II, which was confirmed in situ by means of alcian-blue staining. Chondrogenic differentiation occurred even under normoxia but most notably under hypoxic conditions.

This study supports this fibrin matrix is applicative for autologous cartilage transplants in vitro. In combination with hMSC this tissue engineering approach may have clinical applications at least in reconstructive surgery.

Category: Poster

Titel: The in-vitro biology of equine, ovine, porcine and human articular chondrocytes derived from the knee joint differs

Authors: Schulze-Tanzil G.(1), Müller R.(2), Kohl B.(2), John T.(2),

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Abstract:

Because of the lack of sufficient human cartilage donors, chondrocytes isolated from various animal species were used for tissue engineering and cartilage repair models. The present study was undertaken to analyze key features of in vitro cultured large animal derived and human articular chondrocytes of the knee joint to assess the chondrocyte species with the highest similarity to human chondrocytes.

Primary chondrocytes were isolated from human, porcine, ovine and equine full thickness knee joint cartilage and investigated flow cytometrically for their proliferation rate. Synthesis of the cartilage marker collagen type II, cartilage proteoglycans, non specific matrix proteins such as collagen type I or fibronectin and their cytoskeletal organization was studied in these freshly isolated or passaged chondrocytes using immunohistochemistry and westernblotting.

Chondrocytes morphology, proliferation capacity, extracellular matrix synthesis and cytoskeleton differed substantially between these species. Chondrocytes proliferation was higher in equine, ovine and porcine compared with human chondrocytes. Immediately after isolation, all chondrocytes expressed a cartilage-specific extracellular matrix. However, after monolayer expansion, cartilage proteoglycan expression was barely detectable in equine and ovine chondrocytes whereas fibronectin and collagen type I deposition increased. Porcine and human chondrocytes maintained their proteoglycan synthesis during expansion and synthesized less fibronectin. Compared with human, animal derived chondrocytes revealed more F-actin fibers from the beginning of culture onwards. Pronounced differences in the in vitro biology between human and cattle derived chondrocytes have to be considered using them for cartilage defect repair or disease models. Compared with ovine and equine, porcine chondrocytes shared more similarity with human chondrocytes.

Category: Poster

Titel:Androgen receptors, progesteron receptors and alkaline phosphatase in human primary articular cartilage

Authors: Ebersbach R.(1),Schicht M.(1),Brandt J.(2),Reuse K.(1),Paulsen F.(1),Claassen H.(1),

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Abstract:

Osteoarthritis (OA) is one of the most prevalent joint diseases. It is characterized by a loss of articular cartilage and leads to loss of life quality. Until today allogeneic joint replacement is often the only treatment option. Regarding that the incidence of OA increases in women after menopause and in men after the 3rd life decade, we questioned the possible role of sex hormones, i. e. dihydrotestosterone (DHT) and progesterone (PG), in articular cartilage metabolism. Human primary articular chondrocytes from patients suffering from gonarthrosis were cultured at 5% O₂ for seven days, followed by application of different concentrations of DHT and PG during a serum-free period of two days. Expression pattern of androgen and progesterone receptors was studied using real-time-RT-PCR and Western blot analysis. In addition, expression of alkaline phosphatase (AP) was studied by means of enzyme histochemistry. RT-PCR revealed the expected products of AR and PR. On protein level we found AR at 110 kDa and 72 kDa, PR at 55 kDa and 70 kDa. Furthermore, we detected AP in articular chondrocytes and found that incubation with DHT leads to a stronger expression of this enzyme in comparison to the control. AR is expressed in articular chondrocytes on mRNA and protein level. Surprisingly, preincubation of articular chondrocytes with DHT leads to a stronger immunocytochemical expression of AP. In articular cartilage induction of AP might be followed by widening of the mineralized cartilage zone and by shifting of the tide mark.

Category: Poster

Titel: Altered expression of procollagen alpha1 type I and tenascin proteins induced by HEMA in human pulp fibroblasts.

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Abstract:

Purpose: Tenascin is highly expressed during development while it decreased in mature organs. Under pathological conditions such as infections, inflammation, tumorigenesis and mechanical stress the expression of tenascin is increased.

The aim of this study is to evaluate the effects of the monomer HEMA on the expression and synthesis of procollagen alpha1 type I and tenascin proteins, in human pulp fibroblasts. HEMA is one of most common components of dental composites whom cytotoxicity has been attributed to the release of residual monomers from the polymerized matrix, due to degradation processes or incomplete polymerization. The release of monomers is responsible of adverse effects such as tissue inflammation, apoptosis and inhibition of protein synthesis.

Methods:

Different concentrations of HEMA and different times of exposition were tested. The influence of HEMA on the cell viability was evaluated by MTT assay, while immunofluorescence, western blotting analysis and RT-PCR were performed to detect possible interference of the monomer on the expression and the synthesis of these proteins.

Results:

We observed a strong reduction of cell viability in specimens treated for 96h and 168h. Immunofluorescence, western blotting analysis and RT-PCR demonstrated a reduction of the expression of procollagen alpha1 type I protein and an over-expression of tenascin depended on the exposition time and the increase of HEMA concentration.

Conclusions:

Our results showed that long-term exposure also at low concentrations of HEMA influence the normal cell activity such as the synthesis of some of the dental pulp extracellular matrix proteins and could be markers of cell suffering.

Category: Poster

Titel:Fibre type specific expression of activin receptors type iia (actriia) and iib (actriib) in skeletal muscle

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Abstract:

Pesta D, Frese S, Sailer J, Boelck B, Bloch W

Fibre type specific expression of activin receptors type IIA (ActRIIA) and IIB (ActRIIB) in skeletal muscle

Myostatin (MSTN), a member of the transforming growth factor (TGF)-beta family, acts as a negative regulator of muscle growth. Results from studies on gastrocnemius muscle show that myostatin expression is fibre type specific at least in the rat. The aim of the present study was to investigate the fibre type specific expression of MSTN receptors type IIA (ActRIIA) and IIB (ActRIIB) in human skeletal muscle in comparison to myostatin expression.

To distinguish fast twitch (IIA, IIX) from slow twitch (I) muscle fibres ATPase-staining was performed. After that single muscle cells were isolated from cryo sections of the human M. vastus lateralis by Laser Microdissection and Pressure Catapulting. mRNA was isolated from the samples and transcribed to cDNA. Finally, quantitative Real-Time PCR was performed to quantify the sample.

Our results indicate that myostatin ActRIIA and ActRIIB are expressed in several patterns in type I, IIA and IIX skeletal muscle fibres. The method of single cell isolation is highly suitable for the research on myostatin receptors in skeletal muscle.

Further investigation is needed to show an exact correlation between myostatin receptor expression in comparison to myostatin expression in different muscle fibre types.

Key words: myostatin receptor, single cell, gene expression, mRNA, fiber type

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Category: Poster

Titel:Metabolic profile and nitric oxide synthase expression in skeletal muscle fibres of patients with type 1 diabetes

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Abstract:

Diabetic chronic hyperglycemia and insulin resistance affect skeletal muscle fibre properties such as fibre type distribution, the activity of glycolytic and oxidative enzymes and the nitric oxide synthase (NOS)-expression. To test the alterations hyperglycemia causes independent of insulin resistance we have analysed skeletal muscles of patients with type 1 diabetes with chronic hyperglycemia but preserved insulin sensitivity. From 7 patients with type 1 diabetes and a healthy control group (10 individuals) vastus lateralis muscle biopsies were taken and treated for enzyme histochemistry, immunohistochemistry, cytophotometry and Western blotting. In comparison to normal muscles we found increased glycolytic enzyme activity in muscles of type 1 diabetes patients due to both a higher number of fast glycolytic fibres and a shift towards increased glycolytic metabolism in all skeletal muscle fibre types. These alterations are assumed to be caused in chronic hyperglycemia. Moreover, we found reduced expression of all three NOS-isoforms only in type 1 diabetes in contrast to type 2 diabetes. This suggests that the chronic hyperglycemia which is characteristic for both type 1 and 2 diabetes is not the predominant causal factor for diminished NOS expression. Recent data suggested that C-peptide enhances basal synthesis of NO. Therefore, the lack of C-peptide in type 1 diabetes might contribute to decreased NOS expression.

Category: Poster

Titel: Morphological and immunohistochemical alterations of spontaneously diabetic bb-rats myocardium exposed to ischemia and reperfusion and protection with ginkgo biloba extract

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Abstract:

Morphological and immunohistochemical alterations of spontaneously diabetic BB-rats myocardium exposed to ischemia and reperfusion and protection with Ginkgo biloba extract

R. Schneider, K. Welt, and G. Fitzl

Institute of Anatomy, University of Leipzig, Leipzig, Germany;

Purpose: To evaluate the protective capacity of Ginkgo biloba extract on myocardium in diabetic and ischemic conditions.

Methods: Expression of CuZnSOD, MnSOD, iNOS, eNOS, and substance P were immunohistochemically, parameters of the myocardium were histologically and ultrastructurally analyzed.

Results: Ultrastructural and immunohistochemical ischemia-induced alterations of rat myocardium are significantly more expressed in diabetic BB-rats, consisting in lesions of cardiomyocytes (sarcomeres, mitochondria, vacuolization), in altered enzyme expression (superoxide dismutases as marker of antioxidative state, inducible and endogenous NO-synthases, dilation and basal membrane thickening and rarification of microvessels, increase of interstitial and perivascular collagenes and enhanced mast cell and substance P- accumulation.

Pretreatment with Ginkgo biloba extract (EGb 761) reduces many ultrastructural and enzymatic alterations.

Conclusions: Our results show that EGb 761 protects myocardium from diabetic and ischemia/reperfusion injury.

Category: Poster

Titel:Cyclic loading inhibits activation of the apoptotic pathway caused by loss of homeostatic tendon strain: The importance of the mechanobiological “survival signal”

Authors: Egerbacher M.(1),Caballero O.(2),Lavagnino M.(2),Gardner K.(2),Arnoczky S.(2),

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Abstract:

Purpose: The ability of tendon cells to detect mechanical load signals is a key factor in maintaining tissue homeostasis. To further explore the role of mechanobiological understimulation in the etiopathogenesis of tendinopathy, we examined the effect of stress deprivation on the initiation of the apoptotic cascade in tendon cells.

Methods: Tail tendons from adult Sprague-Dawley rats (RTTs) were divided into 4 groups: 1: control of fresh RTTs (0h); 2: stress deprived (SD, no load) for 24h; 3: 1% cyclic strain at 0.17Hz for 24h; 4: 3% cyclic strain at 0.17Hz for 24h. Cyclic strain was applied to RTTs using a custom made, computer controlled, motor driven device. The effect of stress deprivation and strain on apoptosis rate and caspase-3 mRNA expression was evaluated by Q-PCR and IHC for anti-single-stranded DNA (F7-26) and anti-cleaved Caspase-3.

Results: Stress deprivation resulted in an immediate statistically significant increase of caspase-3 mRNA expression and protein synthesis as well as an increase of the apoptosis rate. Exercise of RTTs at 1% and 3% cyclic strain at 0.17Hz for 24 hours led to a significant decrease of Caspase-3 mRNA levels and significantly reduced the apoptosis rate when compared with SD RTTs.

Conclusions: Our results show the induction of apoptosis through a caspase-3 dependent pathway in a stress deprivation model which can be inhibited by cyclic loading in a dose-dependent manner. This supports the concept of mechanobiological understimulation of tendon cells in the etiopathogenesis of tendinopathy and the benefit of the application of cyclic strain in the non-operative treatment of tendinopathy.

Category: Poster

Titel:Gap junctions in renal epithelia – connexin Cx37 und Cx43

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Abstract:

Gap junctions in renal epithelia – connexin Cx37 und Cx43

Purpose: United cell structures may communicate via gap junctions. This occurs through electrical coupling or transport of small molecules (<1kDa). Connexins (Cx) may form oligomers which are normally grouped pairwise to form intercellular channels or connexons. Renal epithelia possess multiple gap junctions but cell specific distribution of major Cx proteins such as Cx37 and Cx43 are less characterized. The aim of this study was to perform a cell type-specific and subcellular localization of Cx37 and Cx43 in rodent kidney.

Methods: Kidneys of Wistar rats and normal or Cx-transgenic mice were perfusion-fixed for cytochemistry, or shock-frozen for biochemical evaluation. Immunohistochemistry (IHC), immuno-electron microscopy (IEM), in situ hybridisation (ISH), and Western blot (WB) techniques were applied. Specific affinity purified antibodies directed against Cx and nephron segment markers were used.

Results: Cx37 was absent from glomeruli, IHC/ IEM/ ISH-positive in the basolateral membrane of the proximal (PT) and distal tubule (DT) and the collecting duct (CD). Signal intensity correlated with the density of basolateral membrane folding. Cx43 was IHC/IEM/ISH-positive in podocytes. Signals suggested subapical and cytoplasmic distribution in PT, and apical location in DT and CD. Anti-Cx43 antibody specificity was tested with testis- and kidney-specific Cx43 knockouts.

Conclusion: Cx37 and Cx43 signals were widely and cell-specifically distributed in renal epithelia. Basolateral signals suggest the presence of conventional intercellular nexus. The prominent apical Cx43 localization in DT and CD points a potential function as a hemichannel.

Category: Poster

Title: Kidney Na,K,2Cl-Cotransporter (NKCC2) is regulated by Tamm-Horsfall protein (THP)

Authors: Kahl T, Mutig K, Rampoldi L, Boehlick A, Takahashi N, Kumar S, Bachmann S

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No abstract available

Titel:Subcellular and biochemical characterization of gephyrin in liver

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Abstract:

Gephyrin is a tubulin-binding protein that is essential for the aggregation of inhibitory glycine and GABA-A receptors at the postsynaptic membrane. In addition, gephyrin is needed for the biosynthesis of molybdenum cofactor (MoCo), the prosthetic group of molybdoenzymes such as sulphite oxidase, xanthine oxidase and aldehyde oxidase. MoCo biosynthesis proceeds in a three-step process involving the enzymes MOCS-1 and MOCS-2. Since free MoCo is chemically instable, its biosynthesis is likely to occur in a subcellular compartment, possibly in a protein complex containing scaffolding proteins such as gephyrin. To test these ideas, we analyzed gephyrin's subcellular distribution in liver, an organ with high levels of molybdoenzyme activities. Using antigen retrieval procedures and a set of nine specific antibodies on cryosections, we found that gephyrin was enriched in round intracellular aggregates that measured approximately 1 μm in diameter. Similar structures were labelled by immunoelectron microscopy using ultra-thin liver sections. Biochemical studies involving subcellular fractionation, free-flow electrophoresis and blue-native PAGE revealed that gephyrin is part of a large protein complex, whose composition we currently analyze by mass spectrometry. Our data show that liver gephyrin exists in a highly structured subcellular compartment. Moreover, we provide the first evidence showing that gephyrin is part of a multi-protein complex in these compartments.

Category: Poster

Titel:Tieg1/Klf10 contributes to NGF-mediated cell cycle arrest of PC12 cells by upregulation of p21

Authors: Gohla G.(1),Spittau B.(1),Behrendt M.(1),Krieglstein K.(1),

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Abstract:

The control of cell proliferation and differentiation is a key event during development of the central as well as the peripheral nervous system. Nerve growth factor (NGF) together with its receptor TrkA is known to play important roles in this context. As a model for NGF-induced neuronal differentiation, we used the pheochromocytoma cell line PC12. Here we show that NGF-treatment induces the expression of the Sp1-like transcription factor Tieg1/Klf10 which was initially identified as a TGF-beta response gene. In the context of TGF-beta signaling, Tieg1/Klf10 has been shown to promote anti-proliferative and/or pro-apoptotic effects in different cell lines. To address the function of Tieg1/Klf10 in NGF-mediated differentiation of PC12 cells, we transiently overexpressed Tieg1/Klf10 in undifferentiated cells. These experiments clearly showed, that Tieg1/Klf10 mimics NGF effects by upregulation of p21 mRNA and protein levels resulting in cell cycle arrest 24 hours after transfection. Interestingly, overexpression of Tieg1/Klf10 alone does not result in differentiation and neurite outgrowth of PC12 cells. Thus, we propose a model in which Tieg1/Klf10 acts as a downstream mediator in NGF-induced cell cycle arrest in PC12 cells. Moreover, the failure of Tieg1/Klf10 to promote differentiation of PC12 cells supports the certainty that NGF signaling triggers cell cycle exit and differentiation by two separated but tightly coordinated processes.

Category: Poster

Titel:Tieg3/Klf11 modulates TGF-beta; signaling by transcriptional silencing of the inhibitory Smad7

Authors: Spittau B.(1),Gohla G.(1),Krieglstein K.(1),

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Abstract:

TGF-beta signaling plays a pivotal role in the central nervous system regulating developmental cell death. The recently identified TGF-beta-inducible zinc finger protein Tieg3/Klf11 belongs to the family of Sp1/Klf-like transcription factors and shares all structural and functional features with other Tieg proteins. Using the well established TGF-beta-responsive oligodendroglial cell line OLI-neu, we analysed the role of Tieg3/Klf11 in TGF-beta signaling. We demonstrate that Tieg3/Klf11 mimics TGF-beta effects by inducing apoptotic cell death in OLI-neu cells. Further, we show that overexpression of Tieg3/Klf11 results in increased phosphorylation of Smad2 giving rise to enhanced transcriptional activity of receptor-associated Smads. We further give evidence that Tieg3/Klf11-mediated modulation of TGF-beta signaling is caused by transcriptional silencing of the inhibitory Smad7 and consecutive disruption of the negative feedback loop of the TGF-beta signaling pathway. Moreover, loss of the N-terminal repression domains of Tieg3/Klf11 abrogates the pro-apoptotic nature of this transcription factor and abolishes the enhancement of Smad-mediated TGF-beta responses. In conclusion, we provide evidence that the recently identified transcription factor Tieg3/Klf11 is a downstream mediator of TGF-beta-induced apoptosis in the oligodendroglial cell line OLI-neu. Since other signaling molecules are able to initiate transcription of Tieg coding genes, the ability of Tieg3/Klf11 to modulate TGF-beta signaling by transcriptional inhibition of Smad7 might be an important cue to understand the crosstalk between different signaling pathways.

Category: Poster

Titel: Analysis of expression of beta chain of thyroid stimulating hormone (Tshb) and Tsh receptor in the mouse pituitary and brain

Authors: Unfried C.(1), von Gall C.(1), Korf H.(2),

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Abstract:

Melatonin acts on MT1 receptors in the pars tuberalis (PT) and drives a molecular clockwork that leads to rhythmic gene expression. One of these rhythmically expressed genes encodes for the beta chain of thyroid stimulating hormone (Tshb). To differentiate whether the rhythm in Tshb mRNA in the PT was driven by the activation of MT1 receptors or by the molecular clockwork we analyzed by in situ hybridization Tshb expression in transgenic mice lacking the MT1 receptor (MT1^{-/-}) or the transcriptional repressor mPER1 (mPER1^{-/-}) and in the corresponding wildtypes (WT). In WT, Tshb expression was high at mid-night and low at mid-day. In MT1^{-/-} and the mPER1^{-/-} Tshb expression was significantly higher than in WT during mid-day. This suggests an inhibition of Tshb expression by mPER1 which is high during mid-day and low during mid-night. In search for putative targets of TSHb we have analyzed the expression of TSH receptor (Tshr) by in situ hybridization. Most interestingly, Tshr expression was found in the ventrobasal ependymal cell layer of the third ventricle (EC) previously shown to be involved in photoperiodic regulation via controlled expression of deiodinase type 2 (Dio2). Expression of Tshr in EC showed no day-night variation and no significant difference between the four different mouse strains. We conclude that the circadian rhythm in Tshb expression in the PT is driven by the molecular clockwork. Rhythmic TSHb might act on the constitutively expressed TSH receptor in the EC and thus be an important regulator of Dio2 expression in this tissue.

Category: Poster

Titel:Blue Light-Induced Damage in Human RPE Cells

Authors: Roehlecke C.(1),Knels L.(2),Valtink M.(1),Engelmann K.(3),Funk R.(1),

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Abstract:

Cytofluorometrical analysis revealed an accumulation of the AGE product CML (N-carboxymethyl lysine) in cells after exposure to blue light in RPE cells. Metabolic activity of cells was decreased after irradiation with blue light.

Blue light exposure of RPE cells resulted in apoptosis (monitored by investigating subdiploid DNA content/sub-G1 assay and binding of Annexin V), but without enhanced expression of active caspase 3, caspase 8 and caspase 9. Protein expressions of the anti-apoptotic molecule osteopontin, stress-related proteins such as SOD-Mn, heme oxygenase (HO-1), survivin, Hsp-27, Hsp-70, cathepsin D, cathepsin B were increased after exposure to blue light (flow cytometry). According to electron microscopy, the distribution of the mitochondria as well as their shape were found to be changed after irradiation. Irradiated RPE cells revealed some altered mitochondrial profiles with unusual elongation like giant mitochondria. In untreated cells, most of the mitochondria formed a dense cluster on one side of the nucleus. After blue light exposure mitochondria were found in the whole cytoplasmic region. In addition to giant mitochondria, the same cellular region contained also some small mitochondria after irradiation with 1 mW/cm².

Results indicate that the caspase-independent, lysosomal-mitochondrial pathway may be important to blue light-induced apoptosis.

Category: Poster

Titel:Ultrastructure of adult camel lens cells

Authors: Dougbag A.(1),Derbalah A.(2),Zaghloul D.(2),

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Abstract:

The lens cells of adult camel living in desert under unbearable direct sun-rays were studied using Light, transmission and scanning electron microscopy. The lens fibers of adult camels show the flattened ribbon-like shapes with hexagonal outline in transverse section. Each fiber is separated from its adjacent fibers by a light intercellular space of a constant width in the superficial cortex of the lens but it sometimes varies in the deep cortex. The lens fibers show three types of surface junctional projections. The first type is interlocking processes which found along the six edges of the fiber to join the adjacent fibers. These edge processes appear similar to a zip. They are more common in the equator and deep cortical zones of the lens. The second type occurs on the lateral faces of the lens fibers and called ball and socket. It connects two lens fiber faces and is mainly found in the superficial cortex. The third type is a flap or tongue-shaped outpocketing which fits into a complementary shaped imprint formed on the narrow face of opposed lens fibers. It projects from all the six surfaces of the fibers and are clearly observed in the deep cortex. Many gap junctions are present. Deterioration in the cell membrane and loss of its architecture are observed. Inside the fiber, the cytoplasm is completely granulated with few beaded filaments and microfilaments with no clear microtubules. Conglomerates of small electron dens condensation enwrapped by many membranes are observed at the intercellular spaces.

Category: PosterTitel:

Titel: Stimulation of human corneal epithelial cell lines and real-time quantification of expressed surfactant proteins A and D

Authors: Johl M.(1), Bräuer L.(1), Paulsen F.(1),

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Abstract:

Purpose: To investigate the expression of human surfactant proteins (SP) A and D in immortalized human corneal epithelial cells before and after stimulation with bacterial supernatants.

Methods: Expression of mRNA for SP-A and SP-D was analyzed by real-time RT-PCR in human corneal epithelial (HCE) cells which were stimulated with bacterial supernatants. Furthermore, the cellular distribution of both proteins has been determined immunohistochemically in HCE cells before and after stimulation with bacterial supernatants.

Results: The presence of SP-A and SP-D was evidenced and quantified on mRNA-level in HCE cells. Immunohistochemistry, subjectively revealed increased expression of SP-A and SP-D in HCE cells after stimulation with bacterial supernatants.

Conclusions: Our results show that bacterial stimulation of HCE cell leads to increased expression of SP-A and SP-D. The results enhance the known immunological effect of SP-A and SP-D (from lung) and allow its estimation to the tissues of the human lacrimal system and the ocular surface.

Category: Poster

Titel:Functions of Trefoil Factor Family peptide 3 (TFF3) at the ocular surface

Authors: Schulze U.(1),Sel S.(2),Zeigermann M.(2),Amm M.(2),Paulsen F.(1),

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Abstract:

Dry eye syndrome includes various symptoms like hyperosmolarity, impairment of the tear film and an increased apoptosis rate of corneal epithelial cells. Former experiments have shown TFF3 to participate in corneal restitution and its antiapoptotic properties. In this study we investigated its role in vitro under dry eye conditions and its expression in amniotic membrane which is often used for treatment of corneal ulcerations. Tear fluid collected from patients with dry eye syndrome was investigated using a so called ferning test to study the influence of recombinant human TFF3 on the tear film. To study the antiapoptotic effect of TFF3 in vitro under dry eye conditions human corneal epithelial cells were stimulated under normosmolaric and hyperosmolaric conditions (312, 410, 500 mOsm) with and without recombinant human TFF3 (rhTFF3 0,3 µg/ml). The expression of TFF3 in human amniotic membrane was studied by RT-PCR, Western blot and immunohistochemistry. Ferning test results showed strongly the positive influence of rhTFF3 on the crystalization pattern of the tear fluid from patients with dry eye syndrome. Apoptosis assay results revealed a proapoptotic effect of TFF3 in controls and slightly hyperosmolaric stimulated cells compared to unstimulated ones. In contrast, apoptosis was significantly induced under high hyperosmolaric conditions and clearly diminished by addition of rhTFF3. Amniotic membrane showed expression of TFF3 on mRNA and protein level. TFF3 shows a two edged face on the ocular surface. Exposed in healthy conditions it acts proapoptotic whereas under pathological conditions it seems to have protective and antiapoptotic properties.

Category: Poster

Titel:ADAM17 is expressed during the embryonic development of the eye in the basal cells of the cornea, ciliary body and in the endothelial cells of the retinal vessels

Authors: Sel S.(1),Nakhai H.(2),Bräuer L.(3),Duncker G.(1),Paulsen F.(3),

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Abstract:

ADAM17 belongs to the ADAM (a disintegrin and a metalloprotease) family of proteins and is able to cleave the transmembrane form of TNF-alpha (tumour necrosis factor-alpha). The role of ADAM17 in the developing eye has not been studied yet. To analyse the expression of ADAM17 in the developing mice eye we investigated the eyes at embryonic day 12 (E12), E14, E16, E18 and postnatal day 0 (P0), P1, P7, P14, P30 and P120 (adult) by means of immunohistochemistry and RT-PCR. For the first time we demonstrate the expression of ADAM17 in the basal cells of the cornea, in the ciliary body and in the endothelial cells of the retinal vessels during eye development (Figure). Furthermore, we detect mRNA transcripts of ADAM17 in the retina using RT-PCR and direct sequencing of the PCR products. Since ADAM17 is involved in the TNF-alpha and Notch signalling pathway we postulate that ADAM17 may play a pivotal role in the developing eye as well as in eye diseases.

Category: Poster

Titel: The role of Wnt11 in dermis development

Authors: Morosan-Puopolo G.(1), Dai F.(1), Yusuf F.(1), Rehimi R.(1), Brand-Saberi B.(1),

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Abstract:

The role of Wnt11 in dermis development

Gabriela Morosan-Puopolo 1,2, Fangping Dai, Faisal Yusuf1, Rizwan Rehimi1,2, Beate Brand-Saberi1

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Purpose: To elucidate the role of Wnt11 in back dermis development.

Methods: Specific Wnt11 targeting shRNA constructs coupled with an EGFP sequence were designed. These constructs were injected and electroporated into the somites of stage HH14-17 chick embryos. Following reincubation, the embryos were analyzed in ovo under fluorescence and transfected embryos were submitted for in situ hybridization using Wnt11, c-Dermo1, Paraxis and Pax3 specific RNA probes. To look for changes in mitotic behaviour immunohistochemical staining was performed using anti-phospho-Histone H3 antibody.

Results: Wnt11 targeting resulted in a decrease in Wnt11 signal. Likewise, c-Dermo1 was also downregulated following RNAi targeting of Wnt11. Longer incubation times showed a delay in feather bud formation. The dermomyotomal gene Pax3 was strongly upregulated at the transfection site, whereas Paraxis expression was not affected. An increase of mitotic activity was observed around the transfection site.

Conclusion: Our results point towards a role of Wnt11 in dermis development.

Category: Poster

Titel: Identification of a promoter for expression of a bHLH transcription factor ATOH8 gene both in neural tissue and somites

Authors: Dai F.(1), Runkel E.(1), Morosan-Puopolo G.(1), Rehim R.(1), Zhao W.(1), Yusuf F.(1), Bonafede A.(1), Gamel A.(1), Brand-Saberi B.(1),

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Abstract:

Identification of a promoter for expression of a bHLH transcription factor ATOH8 gene both in neural tissue and somites

Fangping Dai, Eva Diana Runkel, Gabriela Morosan-Puopolo, Rizwan Rehim, Wanghong Zhao, Faisal Yusuf, Alexander Bonafede, Anton Gamel, Beate Brand-Saberi

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Purpose: Basic helix-loop-helix (bHLH) transcription factors are key regulators of myogenesis and neurogenesis. A bHLH transcription factor ATOH8 is specifically expressed both in neural tissue and somites of chick embryos. However, the promoter and related regulatory elements of ATOH8 are not clear yet. Here, we try to identify the promoter of ATOH8

Methods: Bioinformatic analysis has been performed based on the ATOH8 gene locus among different species to predict the promoter and the evolutionarily conserved core promoter of this gene which is specifically expressed during embryogenesis. The predicted promoter of the ATOH8 gene has been cloned. Different lengths of candidate promoters for ATOH8 have been constructed into a reporter vector. The plasmids have been transferred into chick embryos *in vivo*.

Results: Our results show that the EGFP reporter gene driven by our predicted hATOH8 promoter can be expressed both in the neural tube and myotomes of chicken embryos. Based on that, the potential MyoD, Myf5, Mef2 binding sites which may represent key regulatory elements in the promoter of ATOH8 gene, have been further predicted.

Conclusions: A promoter for expression of the bHLH transcription factor ATOH8 gene both in neural tissue and somites has been identified.

Category: Poster

Titel:Neuronal repressor proteins (REST/CoREST) show a similar distribution pattern as the stem cell marker Musashi-1 in particular non-neural tissue of the adult mouse

Authors: Wagner A.(1),Schweiggel S.(1),Gehwolf R.(2),Englberger E.(1),Bauer H.(1),Bauer H.(1),

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(2)Department of Traumatology and Sportsinjuries|University Hospital of Salzburg|Salzburg|Austria

Abstract:

The neuron-restricted silencer factor-1 (NRSF-1/REST) is a transcriptional modulator which is basically expressed in non-neural and neural tissue throughout development and adulthood. Originally, NRSF-1/REST was shown to repress the transcription of a large number of neuronal differentiation genes. However, in more recent studies, NRSF-1/REST was also found to be involved in epithelial gene expression and tumour progression. Thus, the previously suggested role of NRSF-1/REST as a neuron-specific silencer has to be re-evaluated.

Here we have followed the expression of NRSF-1/REST and its co-factor CoREST in various tissues of the adult mouse, including kidney, lung, pancreas, and liver. Using immunocytochemistry and in situ hybridization we have shown that the expression patterns of NRSF/REST and CoREST substantially overlap with that of the stem cell marker Musashi-1 (Msi-1).

In the kidney, CoREST was exclusively found in the nucleus while REST was mainly expressed in the cytoplasm of distal tubuli cells. Msi1 showed both, nuclear and cytoplasmic staining in these cells. Some epithelial cells of lung bronchioli stained positive for all three markers, again exhibiting differential localization to nuclei and/or cytoplasm. In the pancreas, only the pancreatic islet cells showed strong expression of REST, CoREST, and Msi-1. Cytoplasm and nuclei of hepatocytes were found to express all markers applied, though to varying extents.

Currently, further studies are being conducted to clarify whether the overlapping expression of the neuronal repressors and msi-1 may serve as an indicator of a decreased differentiative state of adult tissue.

Supported by ÖNB 10800

Category: Poster

Titel: Expression of stem cell markers in human supraspinatus tendon cells

Authors: Gehwolf R.(1), Wagner A.(2), Tempfer H.(2), Lehner C.(2), Mtsariasvili M.(1), Tauber M.(1), Resch H.(1), Bauer H.(2),

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Abstract:

Tendons are anatomic structures transmitting the forces created by muscles and therefore make joint movements possible. They consist of a collagen, elastin and proteoglycan matrix and embedded tendon cells, which are conventionally identified as ovoid tenoblasts and elongated tenocytes. However, detailed studies regarding cell identification and differentiation of tendons lag behind the research of other connective tissues, such as cartilage, bone or muscles. In that respect only a few molecular markers are reported for tenocytes or tenoblast. Generally accepted are cellular markers, such as scleraxis, a basic helix-loop-helix transcription factor, and tenomodulin, a type-II-transmembrane-glycoprotein. A third potential marker is Smad8/9, a receptor-ligated transcription factor, able to directly activate tenocyte proliferation.

To further characterize human supraspinatus tendon cells and to find indicators for tendon cell lineage, the expression of the chondrocyte marker Sox9, various neuronal stem cell markers (REST, CoREST, Nestin, Musashi-1), a pericyte marker (smooth-muscle alpha-actin) and markers for cell differentiation (CD44, CD29) were examined using immunohistochemistry and in-situ-hybridization. Additionally, the expression of all studied marker transcripts in supraspinatus tendons and tendon cell cultures was analysed by RT-PCR. Our results show that tendon cells express the tendon cell markers scleraxis and tenomodulin and that they are positive for the neuronal stem cell markers REST and CoREST, as well as for Musashi-1 and Nestin and the chondrocyte marker Sox9. Supraspinatus tendon cells and cultured tendon cells also show expression of smooth muscle alpha-actin, CD 44 and CD29.

Acknowledgement: this work was supported by ABT, the Lorenz-Boehler-Foundation and by the PMU Salzburg

Category: Poster

Titel:On the complex TMJ disk – mandibular condyle – lateral pterygoid muscle in human fetuses

Authors: Rusu M.C.(1),Podoleanu L.(1),Miculescu F.(2),Miculescu M.(2),Didilescu A.C.(1),Nimigean V.(3),

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Abstract:

In ten human fetuses with gestational ages between 4.5 and 8 months we investigated morphological details on the following TMJ structures: the TMJ disk, the mandibular condyle and the lateral pterygoid muscle. For the study we performed histochemical analysis using the techniques for haematoxylin-eosin and Van Gieson. For the study of the microvasculature we injected black ink and drawn pieces that were diaphanised. For the ultrastructural details we performed SEM analysis. In the growing joint the mandibular condyle surface has a four-layered structure, consisting of an outer fibrous connective layer followed by a proliferative layer, a hyaline cartilage layer with cells having an irregular disposition and a zone of endochondral ossification. With the increasing fetal age the hyaline cartilage layer will diminish and disappear leading to a structure that is also four-layered but consists of an outer fibrous layer, followed by a thin proliferative layer, bone and a deep ossification zone. The fetal TMJ disk presents with a peripheral well-represented microvasculature with characteristic capillary tufts or glomeruli in its posterior part; we also notified vascular units of the lateral pterygoid muscle: discal – muscular and condylar – muscular. In a fetus of 8 gestational months the SEM analysis results evidenced the lower joint space presented as an elongated slit in a posterior intraarticular extension of the lateral pterygoid muscle – discussions have to be done on this viewpoint that seems different to some theories but does not infirm them.

Category: Poster

Titel: A novel role of SDF-1 during the cloacal muscle formation in the developing chick embryo

Authors: Rehim R.(1), Khalida N.(1), Yusuf F.(1), Dai F.(1), Brand-Saberi B.(1),

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Abstract:

A novel role of SDF-1 during the cloacal muscle formation in the developing chick embryo

Rizwan Rehim^{1,2}, Nargis Khalida^{1,2}, Faisal Yusuf¹, Fangping Dai¹, Beate Brand-Saberi¹
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Purpose: In avian embryos, the cloaca acts as a common chamber into which gastrointestinal and urogenital tracts converge. The aim of our study was to investigate the role of SDF-1/CXCR4 axis in the formation of the cloacal muscle.

Methods: mRNA expression pattern of SDF-1, CXCR4, Myo D and Pax7 in the developing cloaca was analysed. Transfection of COS cells with SDF-1-EGFP constructs. Injection of transfected COS cells into proximal limb mesenchyme. In situ hybridization analyses using several myogenic markers.

Results: SDF-1 is expressed in the proximal limb and cloaca during the migration phase of the hindlimb musculature towards the cloaca. Injection of SDF-1 expressing cells into the proximal limb resulted in distraction of migrating cells and an eventual decrease of cloacal musculature.

Conclusions: SDF-1/CXCR4 axis plays a role in the migration of muscle precursors in the hindlimb towards the midline to participate in the development of the cloacal/perineal region.

Category: Poster

Titel:Developmental morphology of the pelvic element in the chick

Authors: Pomikal C.(1),Streicher J.(2),

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Abstract:

While the knowledge about body axis and limb development especially in respect of molecular genetic background and pattern formation has enormously accumulated, the morphology of the axio-appendicular junction - the development of the girdle structures - is dimly comprehended. The present study examines pelvis morphogenesis in the chick, with respect to axio-appendicular linkage, origin and number of elements, as well as the attachment process. Specimens from developmental stage HH1 27 to 35 were serially histologically sectioned, 3D reconstructed and analyzed². In contrast to amphibians³ and mammals⁴ the chick pelvis ab initio locates close to the body axis, although the primary skeletal element in contact - the femur - suggests an appendicular origin. There is no indication of a pelvic reorientation process from the developmental to its final position as observed in other vertebrates^{3,4}. Ossification initiates very late in development and follows a heterochronic pattern. The formation of the synsacrum, the synostotic junction with the ilium, and the omission of ventral closure significantly distinguishes pelvis formation in the chick. These results indicate potential differences in the ontophyletic organization of axio-appendicular linkage, and is subject to further investigations.

1 Hamburger V and Hamilton HL, J Morph (1951) 88:49-92

2 Streicher J et al., Nat Genet (2000) 25: 147-152

3 Wicke W et al., Ann Anat (2003) Suppl: 342

4 Pomikal C, Streicher J (2005) Ann Anat Suppl 187: 158

Category: Poster

Titel: Expression pattern of intermediate-filament proteins during development of the bovine Müllerian duct

Authors: Kenngott R.(1), Vermehren M.(1), Sinowatz F.(1),

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Abstract:

Purpose:

A contribution of cells of the Wolffian duct to the formation of the Müllerian duct is still controversially discussed. We used in situ hybridisation and immunocytochemistry to study this question in the bovine oviduct during its prenatal development.

Material/Methods:

Expression and distribution of vimentin, cytokeratin 8, 18 and 19 were analysed in the Müllerian and Wolffian ducts by in situ hybridisation and immunohistochemistry in bovine embryos and fetuses (CRL 0.9 cm to 5.1 cm)

Results:

Vimentin is distinctly expressed in the mesothelium of the funnel field and the epithelium of the Müllerian duct in all investigated developmental stages, whereas the epithelium of the Wolffian duct only contained a small amount of vimentin mRNA and the corresponding protein. The antibody against cytokeratin 8 and 18 stained the epithelium of the Wolffian duct with varying intensity, whereas the epithelium cells of the Müllerian duct showed no immunoreactions for cytokeratin 8 and 18. mRNA for cytokeratin 19 and its protein could not be demonstrated in the epithelium of both genital ducts at any time of development.

Conclusions:

Müllerian duct and Wolffian duct show significant differences in the expression pattern of intermediate filaments. We, therefore, do not assume a cellular contribution of the Wolffian duct to the developing Müllerian duct.

This study was supported by a grant of the DFG (Si 279/7-3)

Category: Poster

Titel:Morphometry of the semilunar valves in chick embryos of HH34

Authors: Maurer B.(1),Geyer S.(1),Weninger W.(1),

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Abstract:

The chick represents an excellent model organism for researching the influence of biomechanic forces on cardiovascular morphogenesis. Early chick embryos are manipulated in ovo and allowed to develop until the fetal circulation is established. Then they are harvested, and the morphology of the cardiovascular system is analysed. While structural defects can be detected rather easily, diagnosis of valvular stenosis is more complicated. It requires metric analysis and thus reference data defining the normal size of the semilunar valves. Our presentation aims at providing data defining the normal diameter of the fibrous “annulus” of the aortic and pulmonary valves of chick embryos of Hamburger Hamilton (HH) stage 34. We employed a recently developed imaging method named HREM (High resolution episcopic microscopy) for generating volume data from 30 HH 34 chick embryos (voxel size 3x3x3micron). Then we performed virtual reslices through the aortic and pulmonary valves and measured the perimeter of the fibrous “annulus” of the valves. The diameter was calculated from the perimeter. We further calculated the lumen diameter of the ascending aorta midway between the aortic valve and the origin of the left 3rd pharyngeal arch artery. To minimize the influence of varieties in specimen size and the influence of data generation protocols, and to make our data comparable with measurements performed in data volumes generated with other state of the art imaging techniques we calculated the ratio between the diameter of the aortic and pulmonary valves and the diameter of the ascending aorta and provide statistics of the results.

Category: Poster

Titel:Dimensions of the semilunar valves of mouse embryos of Theiler stage 22

Authors: Zendron B.(1),Maurer B.(1),Geyer S.(1),Weninger W.(1),

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Abstract:

Phenotype analysis of genetically engineered model organisms is the backbone for researching the function of genes, which drive cardiovascular morphogenesis. Since deletions and mutations of genes often cause prenatal death the phenotype of embryos must be analysed. In our presentation we present reference data for an objective diagnosis of stenosis of the fibrous “annulus” of the semilunar valves of mouse embryos of Theiler stage (Ts) 22. Digital volume data (voxel size 2x2x2 micron) of 30 mouse embryos were generated with a recently developed technique called HREM (High resolution episcopic microscopy). Using these data, we defined virtual sections perpendicular to the longitudinal axis of the valvular segments of the ascending aorta and pulmonary trunk and measured the perimeter of the fibrous “annulus” of the semilunar valves. The diameter was calculated from the perimeter. We also calculated the diameter of the ascending aorta midway between the aortic valve and the origin of the brachiocephalic trunk, and eventually calculated the ratio between the diameter of the ascending aorta and the diameter of the aortic and pulmonary valves. We present statistics of all these data. By providing relative values in addition to absolute values, we minimize the influence of varieties in specimen size and the influence of data generation protocols, and make our data comparable with measurements performed in data volumes generated with other state of the art imaging techniques. In summary we provide reference data, which permit objective diagnosis of stenosis of the aortic and pulmonary valves of Ts22 mouse embryos.

Category: Poster

Titel: Cd26 does not determine postnatal lung development in untreated f344 rats, but triggers the response to inhaled LPS

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Abstract:

Purpose: We previously reported differences in the inflammatory response to LPS between wild type and CD26-deficient rats. Here, we evaluated the influence of CD26 and aerolized LPS on the postnatal lung development.

Methods: Using CD26 deficient Fischer-344 rats, lung development of untreated and LPS-treated 7-, 10- and 14-days-old rats was analysed. Newborn rats were exposed to high dose LPS on days 3 and 5 or low dose LPS over a period of 7 days, beginning on day 3. The parenchymal changes were determined stereologically.

Results: In the untreated groups no substrain specific changes were found over the period of 14 days. In both substrains an increase in surface densities and a decrease in volume densities and thickness of alveolar septa, as well as in the size of the air spaces, were determined. Compared to untreated controls, high and low dose LPS exposition led to a decrease in surface and volume densities associated with an enlargement of the air spaces in both substrains on days 7 and 10. On day 14 there still was a decrease in surface and volume densities in CD26 deficient rats.

Conclusions: CD26 per se does not influence the postnatal structural lung development. However, in LPS-treated rats changes occurred in terms of a delayed lung development in both substrains. At the end of alveolarization these changes were still obvious in CD26 deficient rats whereas the wild type rats had already recovered.

Category: Poster

Titel:Lipopolysaccharide treatment further potentiates the delay of structural development in erbB4-deleted fetal lungs*

Authors: Behrens J.(1),Purevdorj E.(2),von Mayersbach D.(3),Dammann C.(4),Schmiedl A.(1),

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Abstract:

Purpose: ErbB4 is involved in lung development. Adult HER4heart $-/-$ mice showed a hyperreactive airway system and alveolar simplification. Antenatal lipopolysaccharide (LPS) exposure also influences structural development contributing to the development of bronchopulmonary dysplasia. We hypothesized that antenatal LPS administration affects the structural development and ErbB receptor regulation in ErbB4 deleted lungs of HER4heart $-/-$ mice.

Methods: Pregnant HER4heart $-/-$ mice were intra-peritoneally treated with a solution of LPS (100 μ g/kg) and Patentblau V (200 μ l) at d17 of gestation. Fetal weight was measured and the fetal lungs were used for stereologic analysis, western blotting and PCR. Three different section levels equal in relation to the total high of each lung were defined and stereological evaluated.

Results: LPS/Patentblau solution was detected in each amniotic cavity. Blood cytopspots of the LPS treated mice showed an increase in neutrophils. LPS treated HER4heart $-/-$ fetuses (n=6) 1) were pale and weighted less, 2) showed increased volume density of lung mesenchym, 3) exhibited decreased volume density of ductal airspaces and surface density compared to LPS treated wild type (n=7) and NaCl treated HER4heart $-/-$ mice (n=5).

Most of LPS-treated lungs were delayed in lung development still being at the canalicular stage, whereas control lungs were already at saccular stage.

Conclusions: LPS potentiates delay in structural development of the lung seen HER4heart $-/-$ lungs implying a role of ErbB4 in response to inflammatory lung injury. *Supported by the DFG/DA378/3-1

Category: Poster

Titel:3d visualisation of high resolution episcopic microscopy data

Authors: Dorfmeister K.(1),Weninger W.(1),

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Abstract:

High resolution episcopic microscopy (HREM) is a recently developed three-dimensional (3D) imaging technique, capable for the rapid generation of volume data of embryos of all biomedically relevant model organisms. Our presentation aims at exploring the potential of HREM data to be analysed with 3D modeling and visualisation methods. We generated HREM data of zebrafish, xenopus, mouse, and chick embryos of various developmental stages. Embryos of late developmental stages had to be parted into three segments prior to data generation. The digital data had voxel sizes between $0.54 \times 0.54 \times 2 \mu\text{m}$ and $2.14 \times 2.14 \times 3 \mu\text{m}$ and were composed of 1 000 to 2 000 single images of $2\,560 \times 1\,920$ pixel. For visualiation we used the software package Amira (Mercury Systems) and Velocity (Improvision). The software ran on PCs equipped with a minimum of 8 to 16 GB RAM. We show that the contrast between most tissues is sufficient to provide highly useful volume rendered 3D models. In all explored embryonic stages of all explored species, accurate surface rendered 3D models of DIG labeled tissues, the lumen of empty blood vessels trees, the airways and the gut, but also of organs like the thymus, liver and others can be quickly generated with the aid of 3D thresholding or 3D seed algorithms. In general we are able to demonstrate that HREM data are of sufficient quality to permit rapid 3D visualization and analysis with the aid of state of art visualisation techniques, if high end hardware is used.

Category: Poster

Titel:3D visualization of early bovine embryogenesis by multicolour confocal microscopy

Authors: Habermann F.(1),Leidenfrost S.(1),Boelhauve M.(2),Wolf E.(3),Sinowatz F.(1),

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Abstract:

A systematic three-dimensional microscopic investigation of early bovine development from the zygote to the blastocyst stage aims (a) to gain insight into the principles of initial embryogenesis (b) to disclose critical steps and checkpoints at the blastomere level and (c) to learn to distinguish between normal and aberrant development. The focus of the study includes embryonic genome activation, normal and abnormal cleavage patterns, nuclear abnormalities, cell death, cell-cell interactions and the temporal and spatial expression of key genes and proteins.

In vitro produced bovine embryos were collected at definite time points (up to 7 days) after fertilization for multiple fluorescent staining (e.g. with DAPI for DNA, phalloidin for F-actin and two antibodies detecting two proteins) and confocal laser scanning microscopy (CLSM). From the whole mount embryos we recorded (a) large-scale image stacks encompassing the entire specimen and (b) high resolution stacks of individual blastomeres of interest. The latter were subjected to digital image restoration by iterative MLE (maximum likelihood estimation) deconvolution using the real point spread function (PSF).

We demonstrate the potential of 3D multicolour CLSM to analyse the developmental and functional status of early embryos at the blastomere level. In many embryos we observed signs of the developmental arrest and death of at least one early blastomere prior to/around the maternal-embryonic transition and major embryonic genome activation (during the 4th cell cycle). This early blastomere loss appears to be a critical determinant of embryonic development.

This work is supported by the DGF (FOR 478 and GRK 1029).

Category: Poster

Titel:Effects of Formaldehyde inhalation on intercellular junctions

Authors: Arican R.(1),Sahin Z.(2),Sarikcioglu L.(1),ustunel I.(2),Suzen B.(1),Oguz N.(1),

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Abstract was not presented.

Titel:An experimental model of oxidative stress by light deprivation and exposure to intermitent light of experimental animals

Authors: Zamfir C.(1),Zamfir M.(2),Spataru M.(3),Cojocaru E.(4),Tocan L.(5),

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Abstract was not presented.

Titel: A novel approach with high sensitivity to the localization of peroxisomes in tissue sections and cell cultures

Authors: Grant P.(1), Berg T.(1), Karnati S.(1), Nenicu A.(1), Ahlemeyer B.(1), Baumgart-Vogt E.(1),

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Abstract:

Purpose: Catalase and PMP70 are generally used as markers for peroxisomes. However, their abundance is highly dependent on metabolic demands. We tried to localise and quantify peroxisomes in a wide variety of tissues, cell types or experimental designs independent on abundance or alterations of peroxisomal metabolic enzymes.

Methods: We investigated the applicability of Pex14p, a peroxisomal biogenesis protein, as a marker for peroxisomes in a large variety of organs and species. In addition to standard localisation of the anti-Pex14p antibody with immunofluorescence, peroxidase-based immunohistochemistry, immunogold/proteinA-gold, we used QuantumDots (Qdots) for localisation of peroxisomes in light- and electron-microscopy.

Results: We show that in contrast to catalase and PMP70, Pex14p is present within every peroxisomal membrane and is expressed in similarly high levels in different tissue sections and cell cultures. By Pex14p-staining we could visualize peroxisomes even in cells with undetectable catalase and low PMP70 content, such as most adult neurons of the CNS, alveolar type I cells, endocrine cells of Langerhans islets, germ cells in testis and ovary. We increased the sensitivity in detection of peroxisomes in immunofluorescence by using Qdots. Qdots have higher emission yields and are unsusceptible to photobleaching compared to classical fluorochromes and can thus be used for quantification of peroxisomes. Due to their crystalline structure and high electron density they can also be applied in transmission electron microscopy.

Conclusions: Our results suggest Pex14p as the most accurate peroxisomal marker. By using Qdots we increased the sensitivity for peroxisome detection.

Category: Poster

Titel: Stimulation of autochthonous renal erythropoietin expression by prolyl hydroxylase inhibition

Authors: Paliege A.(1), Rosenberger C.(2), Heyman S.(3), Klaus S.(4), Moreira L.(5), Bachmann S.(1),

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Abstract:

Purpose: To elucidate the effects of a systemic inhibition of HIF prolyl hydroxylases on the renal erythropoietin (Epo) expression pattern and to identify the cellular HIF-targets

Methods: Adult rats were treated for 6h with the HIF prolyl hydroxylase inhibitor, FG-4497, or vehicle via a single intravenous injection. Renal Epo mRNA expression was evaluated by non-radioactive in situ hybridization. HIF-2alpha and HIF-1alpha protein were detected by immunohistochemistry. Co-localization of the HIF-2alpha and Epo mRNA was demonstrated in serial sections.

Results: Treatment with FG-4497 caused a marked increase in the number of cortical interstitial fibroblasts showing immunoreactive HIF-2alpha protein and erythropoietin mRNA. Evaluation of serial sections documented co-localization of the two products. HIF-1alpha immunoreactivity was stimulated as well but did not show local association with Epo mRNA expression.

Conclusions: Inhibition of HIF prolyl hydroxylases causes a significant upregulation of renal Epo mRNA levels. The expression is restricted to cortical interstitial fibroblasts and co-localizes with HIF-2alpha but not with HIF-1alpha. These findings corroborate functional studies demonstrating a prominent role of HIF-2a in the regulation of renal Epo expression.

Category: Poster

Titel: The renal vascular impact of some new piridin-phenothiazines derivatives on kidney in rats

Authors: Cojocaru E.(1), Lupusoru C.(2), Zamfir C.(3),

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Abstract:

Purpose: the aim of this study is to evidentiate the renal vascular effects of two new synthesized piridin-phenothiazinic derivatives, codded as S1 and S2.

Methods: We have used three groups of adult rats: the first is considered to be the witness, the second was treated with S1 derivative and the third was treated with S2 derivative. Both substances were given in intraperitoneal administration, in a unique dose of 2000mg/kg bodyweight. For each tested substance, the animals died in 24 hours after their administration. We prelevated renal tissular fragments from each group, embedding it in paraffine and used for histological exam (HE, PAS, thricromic).

Results: Because the similarity of their tissular effects, we will describe together the vascular alterations produced by S1 and S2. It was instaled a remarkable vasodilatation. From place to place, variable groups of red blood cells erodate the walls of their blood vessels, becoming free in renal interstitium. A number of renal tubules also contained intraluminal erythrocytes.

Conclusions: Both S1 and S2 substances reveal a citotoxic renal vascular potential suggesting precaution in their administration. **KEY WORDS:** VASCULAR RENAL IMPACT, PIRIDIN-PHENOTHIAZINE, VASODILATATION

Category: Poster

Titel:Ultrastructural alteration in liver morphology of Wistar rats induced by anticancer drugs

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Abstract was not presented.

Titel:Nrf2 in Rheumatoid arthritis

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Abstract:

Objectives: Nrf2 is a key player in the oxidative stress response. There is much evidence that oxidative stress plays a key role in the inflammation and destruction of RA joints; the functional relationship between Nrf2 and RA remains unknown, however. In this study, we investigated the function of Nrf2 in an animal model of RA utilising Nrf2-knock out and wild type mice.

Methods: We established an animal model for RA using CII specific monoclonal antibodies, the so-called collagen antibody induced arthritis (CAIA). Joints of treated and untreated animals were investigated using immunohistochemistry.

Results: Compared to wild type, Nrf2-knock out mice showed more severe joint-destruction and pannus formation after CAIA-treatment. Interestingly, CAIA treated Nrf2-knock out mice showed microfissures that could not be seen in wild type.

Conclusions: These results suggest a protective function of Nrf2 in RA, since Nrf2-Knock out mice are more affected than wild type mice. In addition, Nrf2 seems to play a role in osteoporosis a sequela of RA.

Category: Poster

Titel: Bone mineral density, hormonal and biochemical measurements in Turkish children with beta-thalassemia major

Authors: Yildirim F.(1), Ozsoy U.(1), Demirel B.(1), Arican Y.(1), Sarikcioglu L.(1), Ozturk Z.(2), Keser I.(3), Yesilipek A.(4), Ozdem S.(5), Suzen B.(1), Erkilic M.(6), Oguz N.(1),

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Abstract was not presented.

Titel: Bone density of the lateral maxillary area vs. the implant design

Authors: Nimigean V.(1), Nimigean V.R.(2), Maru N.(1), Rusu M.C.(3), Dimcevici P.N.(4), Mihai A.T.(5),

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Abstract:

The lateral maxillary area (LMA) is the most frequent zone of failure in the oral implantology due to the reduced bone density. We performed macroscopic analysis on sections in the LMA, on 40 dry maxillae, at the level P1 – M1. Also we analyzed the bone density in 24 edentulous patients using the 3D volumetric CT (in Hounsfield units). For the experimental design we applied the morphometric method on dry bone at various animal species. The results we obtained demonstrate that in the LMA 65% of the investigated specimens presented with a bone density D3 (Misch classes). Also, the results obtained with both methods correlate. Based upon the researches we performed we established that an implant at the level of the bone of support to have a distance of 1,5 mm. between the crests of the thread, at the level of the cortical zone the distance between the crests of the thread to be 0,5 – 1 mm. and the surface of the implant to be microsandblasted. Supported from the Project CEEEX 101 / 2006.

Category: Poster

Titel:Experimental algorithms in the oral implantology

Authors: Măru N.(1),Nimigean V.(1),Nimigean V.R.(2),Rusu M.C.(3),Salavastru D.I.(1),Sirbu I.(4)

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Abstract:

Aim: to determine a model of implant after the morphometry of the lateral maxillary area (LMA) that is a problem-zone in the oral implantology, from the point of view of the bone density and of the anatomical obstacle represented by the maxillary sinus. We performed morphological and morphometrical analyses in the LMA at animals (dogs) to evaluate the cortical sizes, the amount of support bone and the height of the available bone. We defined 5 different experimental models that we present here. The results we obtained allow and support the choice of an optimal model of implant in function of the morphological parameters of the targeted area.

Category: Poster

Titel: The effect of the histamine on the neuronal hypertrophy and mast cell density in gastrointestinal tract, reversible or not?

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Abstract:

Purpose; Gastrointestinal system is working under the control mechanism of the immune system, because of the infection agents and antigens received with the food during evolution. Mast cells have somehow functional roles in the inflammatory cases and local regulation of the immune system. There are some information about the effected neural functions and taking a shape of the neurone, during the inflammation of these cells. Histamine has also significant effects in regulation of the immune system. For this reason, we performed our studies in order to research the effect of the histamine in the gastrointestinal tract on the increasing of the mast cells density (MCD) and the neural hypertrophy.

Material Methods; Intraperitoneal histamine injection was applied to the mice for a 7 days period. 20 mg/kg Histamin diluted in 0.5 ml physiological serum was used for this purpose. We took the samples in the 7th, 30th, 60th days of the experiment. After the routine histological procedure and at the end of the immunohistochemically applications, the density of the triptase positive mast cells and PGP 9.5 immunoreactivity of the neuronal structures were evaluated.

Results; The results were as MCD/mm² 20.4, PGP 9.5 positivity 14.8, Mean area of Ganglia/ μ m² 241.2, Number of Ganglia/mm² 8, Number of Schwann cells/mm² 27.1 in histamine group and MCD/mm² 9.7, PGP 9.5 positivity 3.2, Mean area of Ganglia/ μ m² 90.5, Number of Ganglia/mm² 5, Number of Schwann cells/mm² 11.3 in control group.

Conclusion; Finally, the differences of the mast cells density and neuronal hypertrophy and the differences belongs to the tissue sampling time was identified.

Category: Poster

Titel: Distribution and three-dimensional appearance of the interstitial cells of Cajal in the rat stomach and duodenum

Authors: Nam K.(1), Geyer S.(1), Weninger W.(1),

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Abstract:

This study was performed to clarify the distribution of ICC and the connection between ICC and enteric nerves or smooth muscle cells in rat stomach and duodenum.

Immunohistochemical staining clearly demonstrated that c-kit expressing ICC were regularly observed in the region of Auerbach's myenteric plexus (AP) of stomach and duodenum. The ICC in muscle layers showed different distribution patterns between these organs. Cells with c-kit immunoreactivity were sparsely distributed in circular muscle layer of stomach, but they were abundant in deep muscular plexus (DMP) of duodenum.

By electron microscopy, ICC-AP in stomach was irregular oval shape and had a few cytoplasmic processes, and was characterized by possessing an electron-dense cytoplasm, many mitochondria, intermediate filaments and caveolae in plasma membrane. ICC-AP in duodenum was similar in appearance to those of stomach. Ultrastructural observation with serial sections and three dimensional reconstruction showed that processes of ICC-AP wrapped nerve fibers and projected into the space between smooth muscle cells. Though ICC-AP was occasionally close to enteric nerves or smooth muscle cells, no connections were observed among them. ICC-DMPs in duodenum were elongated cells showing same orientation of cell axis as circular muscle cells. Unlike ICC-AP, ICC-DMP formed gap junctions with smooth muscle cells and had close contact with nerves.

These results indicate that ICC-AP is regularly distributed in stomach and duodenum, but ICC-DMP is located in duodenum. The findings also suggest that ICC-DMP, which possesses gap junctions and is in close contact with nerves, may have some role in neuromuscular transmission.

Category: Poster

Titel:Reduced number of the intracardiac neurons in diabetic Goto Kakizaki rats

Authors: Batulevicius D.(1),Frese T.(2),Peschke E.(2),Batuleviciene V.(3),Pauza D.(1),

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Abstract:

Purpose: To evaluate the number of the intracardiac neurons in Goto-Kakizaki (GK) rats, a popular model of type 2 diabetes.

Methods: Twelve GK rats and 13 metabolic healthy Wistar rats as controls were used. Blood glucose was determined using test stripes, plasma insulin by RIA. The intrinsic ganglia were stained for acetylcholinesterase on total hearts. The number of somata of the intrinsic cardiac neurons was approximated according to the ganglion area.

Results: The GK rats exhibited significantly increased blood glucose levels compared to the controls, but the concentration of plasma insulin did not differ significantly between both groups. The control rats contained 78 ± 6 intracardiac ganglia (mean \pm SEM) while this number in GK rats was reduced to 55 ± 4 ($P < 0.01$). Estimated total area of the intracardiac ganglia in control rats was 2.23 ± 0.10 mm². It was decreased to 1.38 ± 0.06 mm² in GK rats ($P < 0.001$). Strong correlation between the ganglion area and neuronal number was found for both controls ($R = 0.978$) and GK rats ($R = 0.975$). Estimated total number of the intracardiac neurons in control rats was 2395 ± 110 . It was significantly lower in GK rats, 1461 ± 62 only ($P < 0.001$). The reduction of the number of the intracardiac neurons in GK rats was characteristic for both cardiac regions examined.

Conclusions: We conclude that the marked decrease of the neuronal number in the hearts of diabetic GK rats reflects a loss of intrinsic neurons due to metabolic disorders. This loss of neurons may account for the functional alterations of the intracardiac nervous system in diabetes-induced cardiac autonomic neuropathy.

Category: Poster

Titel: Evaluation of morphological issues of central nervous system glioblastoma on chicken embryo chorioallantoic membrane

Authors: Balciuniene N.(1), Valanciute A.(2), Graf von Keyserlingk D.(2), Tamasauskas A.(1),

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Purpose: To evaluate the central nervous system glioblastoma growth on chicken chorioallantoic membrane (CAM).

Methods: Glioblastoma pieces taken from operated patients were transplanted on fertilized hen's eggs chorioallantoic membrane. Their growth was evaluated by stereo microscopy, histological and immunohistochemical methods.

Results: In our studies glioblastoma samples taken from 10 patients were transplanted onto 200 eggs. During growth the colour of the transplant changes, necrosis and oedema appear. Avian vessels invade transplant. Human and avian vessels can be distinguished between each other by the erythrocyte nucleus. Glioblastoma cells vary in size and form. Lymphocytes aggregate mainly at the border of CAM. The main immunohistochemical markers of glioblastoma - GFAP, vimentin, Ki67, S100 protein were also positive. We also found macrophages in the tumor.

Conclusions: Glioblastoma survives on chicken CAM, showing its typical morphological features. The growth is mainly supported by avian vessels. The main immunohistochemical parameters are positive during all growth period showing that glioblastoma doesn't change its features on embryo membrane.

Category: Poster