

only be transduced through gap junctions but also through the mere presence of connexons or even connexins. The expression of cx differs according to their location and function. In human and rodent reproduction, deficiencies in cx expression lead to inadequate embryo implantation and trophoblast invasion and also characterize stages of malignancy in endometrial carcinogenesis. Therefore, cell-cell communication via gap junctional cx may be essential for the restricted trophoblast invasion performed by migrating trophoblast giant cells (TGC) in the synepitheliochorial placenta of the cow. TGC fuse with single caruncular epithelial cells forming mostly trinucleated feto-maternal hybrid cells which deliver hormonal products to the maternal compartment.

To study the potential role of connexins during placentomal development we localized cx26, cx32 and cx43 in frozen sections from day 90-210 of pregnancy and primary cell cultures by immunofluorescence and confocal laser scanning microscopy. The presence of the corresponding cx proteins was confirmed by Western blot analysis.

Although cx26 was present in tissue sections (trophoblast cells) it could not be detected in placentomal cell cultures. Surprisingly cx32 was localized in nuclei of cultured caruncular epithelial cells, whereas in placentomal sections it was found in caruncular stroma and caruncular epithelium specifically at the tips of maternal septa. In contrast to in vivo material, only cultured fibroblastoid cells were positive for cx43. In tissue sections also mononuclear trophoblast cells showed an apical-lateral cell membrane associated cx43 expression. In TGC, cx43 signals differed depending on the localization within the placentome. In the centre of the placentome cx43 was associated to the cell membranes whereas at the base of the fetal villi TGC additionally showed cytoplasmatic cx43 specific fluorescence. In contrast, TGC which were about to fuse with uterine epithelial cells and hybrid cells were negative.

We may conclude that apical cx43 localization supports the hypothesis that cx43 connexons may be involved in the regulation of cell proliferation without forming gap junctions. The correlation of TGC invasion with the loss of cx43 suggests that cx43 plays an important role for the differentiation and migration of TGC. The unexpected finding of cx32 in nuclei of cultured caruncular epithelial cells cannot be explained up to date. The loss of cx26 and cx43 during cell culture of epitheloid cells may be due to suboptimal culture conditions. Funded by the German Research Foundation (DFG).

APPLICATION OF COMPUTER ASSISTED THREE-DIMENSIONAL VISUALIZATION TECHNIQUES IN HISTOLOGY, MEDICAL COMPUTER TOMOGRAPHY AND NUCLEAR MAGNETIC RESONANCE IMAGING

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Over the last years, three-dimensional imaging has become more and more prevalent in biomedical and material science studies. For almost every highly specialized application, different specific 3D-software solutions have been designed. Although the 3D visualization package amira ResolveRTM has primarily been developed for confocal microscopy, it has also proven to be a valuable instrument in different other applications. In recent studies performed at our department, this stand-alone software pack turned out to be a rewarding tool

in morphometrical examinations of the equine semicircular canals starting from medical CT images, ex-vivo haemodynamic studies in porcine and human livers observed by MRI and micro-CT, and histological investigations on the developing digestive system in sea bass larvae and juveniles. The major benefits of this versatile application include the fact that image segmentation is not necessarily based on pixel value thresholds, its ability to deal with unaligned or lost slices and its capacity to render different types of real 3D stereo images or movies, starting from a wide range of input data types. Although the user can easily intervene in almost every automated process such as image alignment or labelling, many of these manual corrections and adaptations are rather time-consuming. Another inconvenience is that the broad potential and complexity of the program causes a substantial load of the internal and graphical memory of the system. Notwithstanding these disadvantages, investment in this software is certainly paying off as it can offer unparalleled representations of complex structures as a basis for the development of new insights in various morphological domains.

Poster presentations: summaries Povzetki posterjev

ELEMENTS OF THE ANATOMY OF TWO STURGEONS (ACIPENSER STELLATUS PALLAS, 1771 AND ACIPENSER BAERII BRANDT, 1869): OSTEOLOGY AND RADIOLOGY

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Most of the studies that have been carried out on the Acipenseridae concern evolution, phylogeny, diversity, conservation and reproduction, notably concerning their economic importance for caviar production (Billard, 2002). However, information about the peculiar osteology of this family is relatively rare. The only osteologic data that can be found in the literature (Grassé, 1958 ; Findeis, 1997) are difficult to use in the diagnosis of the bone remains discovered on archaeological sites and are only known for a few species (Radu, 2003). Consequently, a study associating dissections and radiology observations has been attempted in order to gather anatomical information.

Two individuals of two different species have been studied here: a Siberian sturgeon *Acipenser baerii* and a stellate sturgeon *Acipenser stellatus*. The first species is potamodromous (migration only in fresh water) while the second is diadromous (migration between salt water and fresh water).

This work is a preliminary contribution to the knowledge of the osteology of these two species of sturgeons and we hope that it will be developed in a near future.

References

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