

## A swine model for meniscus maturation during growth

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The meniscal vascular network changes during growth leading to the formation of a very heterogeneous tissue, with both a fibrous and cartilaginous matrix. This work focuses on the changes in the meniscus matrix and cell phenotype during growth. Menisci were harvested from young and adult pigs and cut into the two horns and the body. DNA and GAGs contents were determined; other samples were stained with SAFRANIN-O, for proteoglycan distribution, and contemporary stained for collagen 1 and 2; other samples were processed for collagen 1 and 2 quantification by western blot analysis. Moreover, the body of each meniscus was divided into the inner, the intermediate and the external zone; each of them was processed for gene expression analysis. The obtained data showed a strong increase in GAGs production during growth as also observed by other author in cows (Ionescu et al, 2011), with an higher distribution in the inner area of the meniscus, in particular in the anterior horn; no differences were observed in the cellularity; collagen 2 deposition increased in the anterior horn during growth being confined mainly in the inner area, while collagen 1 deposition decreased being confined mainly in the external area. The analysis of the inner, intermediate and external zones showed that the intermediate one assumes a fibro-chondrocyte phenotype during growth becoming similar to the inner one. In conclusion, meniscus growth, from young to adult, is accompanied by a maturation of the anterior horn into a fibro-cartilaginous tissue; moreover, not only the whole inner but also the intermediate area of the meniscus develops fibro-cartilaginous properties during growth.

### References

Ionescu et al. (2005) Maturation state-dependent alterations in meniscus integration: implications for scaffold design and tissue engineering. *Tissue Eng* 17: 193-201.

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