

# 3<sup>rd</sup> International Conference on Tissue Science & Regenerative Medicine

September 24-26, 2014 Valencia Convention Centre, Spain

## The impact of histological re-evaluation of tissue engineered strategies in articular cartilage repair -Results of human applications

**Christoph Brochhausen**  
University Medical Centre Mainz, Germany

Several tissue engineering based strategies to treat articular cartilage defects – such as autologous chondrocytes transplantation (ACT) or matrix assisted autologous chondrocyte transplantation (MACT) - are already in clinical use. However, none of them provides optimal results with view to regeneration of hyaline cartilage. An innovative new strategy to treat articular cartilage lesions is the implantation of autologous chondrocytic spheroids. We present histological re-evaluations of second-look biopsies of MACT patients and for the first time such of autologous chondrocytic spheroid application. Biopsies were taken from 6 patients treated with Standardized synthesized MACT-constructs or autologous chondrocytic spheroids. The Second-look biopsies were taken between four and sixteen months after implantation during a second arthroscopy, which was indicated independent of the (ACT). Biopsies (n=2) were fixed in buffered formalin and prepared according to standard methods for conventional histological (HE, alcian-blue) and immunohistochemical (collagen II, aggrecan) examination followed by semiquantitative evaluation. Biopsies from MACT-constructs showed fibrous tissue without relevant collagen II or aggrecan expression. Biopsies from spheroid based autologous chondrocyte transplantation showed typical articular cartilage architecture with expression of collagen II and aggrecan. To our knowledge this study is the first histomorphological evaluation of scaffold-free spheroid based ACT in humans. The heterogeneous results of our re-evaluations demonstrated the need for a systematic biopsy-collection and their combination with clinical data to provide an evident evaluation of the used tissue engineering based strategies to treat cartilage defects. Furthermore, such analyses could give an innovative input in further developments of the guided tissue engineering of cartilage defects.

### Biography

Christoph Brochhausen is Chief Consultant Pathologist and Head of Electron Microscopy at the Institute of Pathology at the University Medical Centre Mainz as well as Group Leader of the Cartilage Tissue Engineering Group at the REPAIR-lap. His research-work was awarded by national and international awards. He has published more than 80 papers in reputed journals and serving as an editorial board member of some reputed journals.

[brochhausen@pathologie.klinik.uni-mainz.de](mailto:brochhausen@pathologie.klinik.uni-mainz.de)