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**UNIVERSITÄT
BERN**

Graduate School for Cellular and Biomedical Sciences

Mid-Term Exam:

Martina Caliò

Characterization of IVD cell populations and degenerated articular chondrocytes

Lower-back pain leads to 10,000 hospitalizations annually in Switzerland. The reason for this severe medical situation is often based on disorders of the intervertebral discs (IVD). Despite the last 30 years of intense research within the field, the numbers of patients keep rising. The inability of the classification in predicting what is "normal" in aging discs as opposite to degenerating discs indicates the limitations of this prediction system. This indicates a macroscopic variability of the phenotype that hints at the need for more research. In this project we aim at identifying the cell populations in the nucleus pulposus and the annulus fibrosus of bovine IVDs, as to be able to monitor cell population shifts under degenerative conditions. For the second project on human chondrocytes, we focus on Osteoarthritis, as a multifactorial disease leading to joint dysfunction and pain caused by cartilage degeneration. Like many human tissues, cartilage does not regenerate spontaneously. To produce sufficient chondrocyte numbers for implantation, the chondrocytes must undergo several divisions in-vitro. This process, however, compromises their differentiation status. Using chondrocyte cultures under simulated microgravity on a random positioning machine (RPM), has been repeatedly proven to provide three-dimensional, differentiated tissue-like cell clusters. We aim at establishing a 3D scaffold-free articular cartilage tissue culture in the human model, that provides sufficient amounts of cartilage for autologous cartilage transplantation.

Supervisor: Prof. Dr. Benjamin Gantenbein

Co-Advisor: Prof. Dr. Marcel Egli

Mentor: Prof. Dr. Volker Enzmann

**Tuesday, November 26, 2019, 15:30 h
Seminar room H812, Murtenstrasse 35, Bern**

You are cordially invited to join!