Abstract for the Symposium “DKOU-Musculoskeletal Regeneration: translational aspects of the biology and pathology of musculoskeletal tissues”:

**Tendons, immune cells and surrounding tissues: an interplay?**

Tendon disease represents one of the remaining unsolved clinical problems with a constantly growing patient group in need for solutions to regenerate injured tendons. Tendon regeneration is a complex process and the role of inflammation and immune cells is still under debate. Furthermore, processes were so far seen independent from surrounding tissues, but adjacent tissues might substantially impact the regenerative cascade. Specifically, the subacromial bursa at the rotator cuff is thought to influence the local inflammatory milieu. A bursectomy, the removal of the bursa, is one of the most commonly performed shoulder surgery but its significance is still unclear.

Our research provides evidence that inflammatory processes are crucial in acute ruptures and also degenerative tendon pathologies. In the acute rupture situation, inflammatory conditions and matrix remodeling processes can also impact the tendon healing outcome. We furthermore were able to show that tenocytes are immunoresponsive and can interact with immune cells, more specifically, macrophages. High proportions of immune cells are located in tendon surrounding tissue such as the subacromial bursa, which is increasing during bursal inflammation in different shoulder pathologies. Beyond that, the bursa is a highly vascularized tissue and contains cells with stem cell properties, which might positively influence tendon regeneration. Knowledge about the mechano-responsiveness of bursa-derived cells regarding the potential to adapt the extracellular matrix composition as well as basic cellular processes in response to loading is important to better understand the physiological function of the subacromial bursa as a friction-reducing structure in the shoulder joint. Thus, different mechanical stresses could have an impact on the interaction between bursa and tendon. Altogether, we believe that inflammatory mediators and tendon surrounding tissues are key players in tendon regeneration processes or the development of tendon pathologies.