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Titel des Beitrags: MALDI MS imaging as a powerful tool for investigating synovial tissue.

Abstract: To identify and image protein biomarker candidates in the synovial tissue of patients with rheumatoid arthritis (RA) and patients with osteoarthritis (OA). A novel matrix-assisted laser desorption/ionization (MALDI) imaging mass spectrometry (IMS) technique was applied to the analysis of synovial tissue. Patients were classified according to the American College of Rheumatology (ACR) criteria for RA. Frozen sections were stained to obtain morphological data. Serial sections were desiccated, and spotted with matrix for MALDI analysis. Ions generated by laser irradiation of the tissue were separated in time, based on their m/z ratio, and were subsequently detected. IMS was used in a 'profiling' mode to detect discrete spots for rapid evaluation of proteomic patterns in various tissue compartments. Photomicrographs of the stained tissue images were reviewed by a pathologist. Areas of interest (10 discrete areas/compartment) were marked digitally and the histology-annotated images were merged to form a photomicrograph of the section taken before the MALDI measurement. Pixel coordinates of these areas were transferred to a robotic spotter, the matrix was spotted, and the coordinates of the spots were transferred to a mass spectrometer for spectral acquisition. The data generated were then subjected to
biocomputation analysis to reveal the biomarker candidates. Several peaks (m/z) consistent in mass with calgranulins, defensins, and thymosins were detected and their distribution in various synovial compartments (synovial lining and sublining layer) was demonstrated. MALDI IMS is a powerful tool for the rapid detection of numerous proteins (in situ proteomics) and was applied here for the analysis of the distribution of proteins in synovial tissue sections.

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