

## ELEMENTAL IMAGING IN OSTEOARTHRITIC JOINT BONES

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Osteoarthritis (OA), the clinical syndrome of joint pain and dysfunction caused by joint degeneration, affects more people than any other joint disease. The histological disease pattern of OA in human joints include fibrillation of articular cartilage, clefting, and cartilage loss. Besides cartilage lesions a thickening of subchondral bone as well as a tidemark duplication is observed in OA. The appearance of multiple tidemarks indicates additional cartilage calcification and it is believed that this newly calcified cartilage may be remodelled into subchondral bone. In a recent study we could demonstrate that in non arthritic bones the formation of tidemarks is accompanied by an accumulation of the trace elements lead (Pb) and zinc (Zn) at these zones. In the present work the elemental distribution, with special emphasis on Zn and Pb, was studied in joint bones from human hip head with different degrees of OA.

Synchrotron radiation induced micro XRF measurements in confocal geometry have been carried out at beamline L, HASYLAB, Germany, and the obtained data has been matched with backscattered electron (BE) images.

The presented paper will discuss the distinct differences in Zn and Pb distributions obtained from bones showing tidemark duplication, advanced degradation from hyaline to fibril articular cartilage as well as cartilage loss. Results indicate a resorption of the toxic element Pb into circulation in case of advanced OA. Additionally increased Zn intensities at the outer border of AC were found which could not be seen in the case of non-arthritic bones.