Late Stage Osteoarthritis Reveals Increased Expression of SQSTM1

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Osteoarthritis (OA) is a debilitating disorder affecting over 27 million adults in the United States; with the knee being the most commonly affected joint. During OA progression the articular cartilage (AC) of the knee is degraded and subchondral bone (SB) formation is increased. Sequestosome 1 (SQSTM1), a protein typically indicative of bone deterioration in Paget's disease, is associated with oxidative stress and excessive osteoclast proliferation. We hypothesized that SQSTM1 may also be expressed during OA progression; which results in increased SB turnover, remodeling and the formation of structurally incompetent bone. To test this hypothesis, we localized and quantified SQSTM1 expression in femoral condyle tissue samples classified according to the Osteoarthritis Research Society International grading scale as either early- or late-stage OA. Additionally, SQSTM1 expression was compared between the SB and AC. Histological staining of femoral tissues from 9 total knee arthroplasty patients was performed to verify OA disease status. Immunohistochemistry with an antibody to SQSTM1 and microscopic imaging and analysis with Fiji ImageJ was used to determine tissue specific production. Results indicated an increased amount of SQSTM1 associated with late-stage OA tissue samples. The data showed variation in SQSTM1 by disease status, but not tissue type; as there was no significant difference between SB and AC tissues. Additional studies on the role of SQSTM1 in OA may provide novel insights into the physiology of OA, and examining the expression of SQSTM1 in synovial fluid may provide a method to assess OA progression before surgical intervention.

Awards Won:
Fourth Award of $500