

# FOLLOW-UP OF COLL2-1, COLL2-1NO<sub>2</sub> AND MYELOPEROXYDASE IN DOGS AFTER TRANSECTION OF THE CRUCIATE LIGAMENT OF THE KNEE

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## PURPOSE

To determine the profile of Coll2-1, Coll2-1NO<sub>2</sub> and myeloperoxidase (MPO) serum concentrations in experimental knee OA induced in the dog by transection of the anterior cruciate ligament

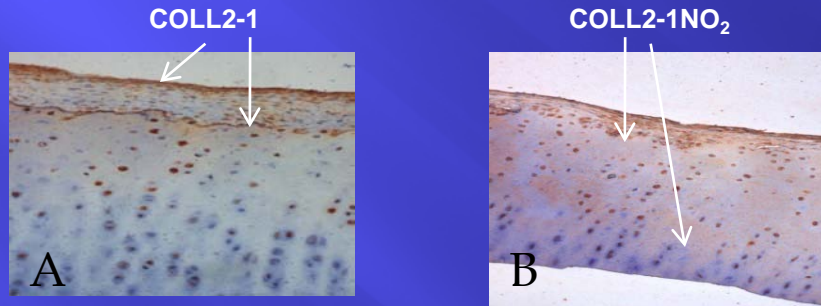
## METHODS

Surgical transection of the ACL of the right knee was performed on 16 adult crossbred dogs. The dogs were sacrificed 8 weeks after the surgical procedure. Coll2-1, Coll2-1NO<sub>2</sub> and MPO were measured by specific immunoassays in 16 dogs at baseline and every 2 weeks during the 8 weeks. The results were expressed as median (range). The Friedman test estimated the variation for each biomarker every 2 weeks during the 8 weeks. After 8 weeks, we have calculated the microscopic and the macroscopic scores and have realized immunohistochemistry with antibodies directed against markers of cartilage degradation, Coll2-1 and Coll2-1NO<sub>2</sub>.

## RESULTS

### 1. IMMUNOSTAININGS WITH D3 AND D37, THE ANTISERUM RECOGNIZING COLL2-1 AND COLL2-1NO<sub>2</sub>, RESPECTIVELY.

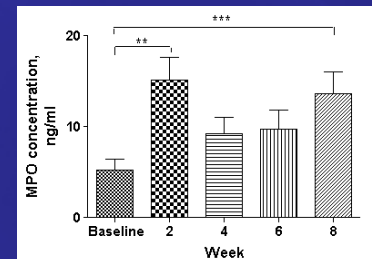
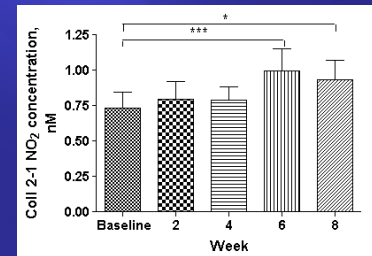
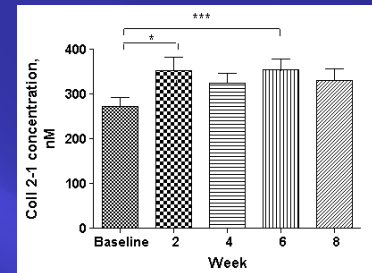
D3 antibodies (Coll2-1) labeled chondrocytes and the extracellular matrix (A). An intense dark brown labeling was observed in the superficial layer of the fibrocartilage-like. With D37 antibodies (Coll2-1NO<sub>2</sub>) (B), we obtained in addition an intense staining of the chondrocytes and of the extracellular matrix of intermediate layer.



### 3. MACROSCOPIC AND MICROSCOPIC SCORES

The global macroscopic score correlated positively with the 8-week changes of Coll2-1 ( $r=0.57$ ,  $p=0.02$ ). No similar correlations were found for Coll2-1NO<sub>2</sub> and MPO. Finally, there was a positive correlation between the 4-week changes of Coll2-1 and Coll2-1NO<sub>2</sub> and the microscopic score of cartilage lesion severity (condyles; Coll2-1:  $r=0.56$ ,  $p=0.025$  and Coll2-1NO<sub>2</sub>:  $r=0.52$ ,  $p=0.049$ ). No similar correlations were found for MPO.

### 2. BIOMARKERS MEASUREMENTS



After the transection of the ACL, the concentration of the 3 biomarkers increased significantly (Friedman test: Coll2-1, Coll2-1NO<sub>2</sub> and MPO:  $p<0.001$ ). The concentrations of Coll2-1 and MPO were significantly increased at week 2 compared to baseline [Coll2-1 baseline: 281.57 (131.02-384.67) nM vs Coll2-1 week 2: 345.52 (181.15-589.25) nM and MPO baseline: 5.16 (<0.4-14.7) ng/ml vs MPO week 2: 14.54 (3.28-31.50) ng/ml] and remained stable until week 8 [Coll2-1 week 8: 318.89 (117.95-492.28) nM and MPO week 8: 11.55 (2.87-42.94) ng/ml]. The Coll2-1NO<sub>2</sub> concentration increased significantly at weeks 6 and 8 compared to baseline [Coll2-1NO<sub>2</sub> baseline: 0.54 (0.29-1.48) nM vs Coll2-1NO<sub>2</sub> week 6: 0.64 (0.40-1.9) nM vs week 8: 0.61 (0.37-1.79) nM].

## CONCLUSIONS

These findings suggest that Coll2-1 is a relevant marker for the detection of early structural changes in OA dogs. Interestingly, MPO and Coll2-1NO<sub>2</sub> are increased in OA dogs indicating that an oxidative stress occurs in this OA model.