



9. Expression of PPAR α , b, g, and H- and L-PGDS during Osteoarthritis in the Spontaneous Hartley Guinea Pig and the Experimental Dog Models

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Objective: To investigate the expression of peroxisome proliferator-activated receptor (PPAR) α , b, g, and hematopoietic and lipocaline-type prostaglandin D synthase (H- and L-PGDS) over the course of osteoarthritis (OA) in the spontaneous Hartley guinea pig and the anterior cruciate ligament transection dog models.

Methods: Guinea pigs were sacrificed at 2 (control group), 4, 8, and 12 (n = 5 per group) months of age. Non-operated (control) and operated dogs were sacrificed at 4, 8 and 12 weeks post-surgery. Cartilage was evaluated histologically using the Osteoarthritis Research Society International (OARSI) guidelines. The expression of PPAR α , b, g, and H- and L-PGDS were evaluated by real-time PCR and immunohistochemistry. The non-parametric Spearman test was used for correlation analysis.

Results: PPAR α , b and g were detected in medial tibial plateau from control animals in both the spontaneous and surgical models. The levels of PPAR α and b did not change over the course of OA, whereas PPARg levels decreased during the progression of the disease. We also showed that the expression of H-PGDS remained unchanged, whereas that of L-PGDS increased over the course of OA. PPARg levels correlated negatively, whereas L-PGDS levels correlated positively, with the histological score of OA.

Conclusion: The level of PPARg decreased, whereas that of L-PGDS increased during the progression of OA. These data suggest that reduced expression of PPARg may contribute to the pathogenesis of OA, whereas enhanced expression of L-PGDS may be part of a reparative process.