

THE IDENTIFICATION OF A DIAGNOSTIC BIOMARKER PANEL FOR CANINE OSTEOARTHRITIS

Bridget C. Garner

Charles E. Wiedmeyer, Dissertation Supervisor

ABSTRACT

A novel biomarker panel for the diagnosis of early osteoarthritis (OA) in canines has been identified. This panel consists of monocyte chemoattractant protein 1 (MCP1), interleukin-8 (IL-8), keratinocyte-derived chemoattractant (KC), matrix metalloproteinase 2 (MMP2), matrix metalloproteinase 3 (MMP3) and matrix metalloproteinase 13 (MMP13).

This panel was evaluated in dogs with induced, as well as spontaneous, knee OA, and it was consistently able to distinguish between normal and osteoarthritic individuals. *In vitro* studies in the hip suggested the articular cartilage and subchondral bone were at least partially accountable for these fluctuations.

Proteomics methods were utilized to investigate differences in protein profiles from the culture studies, as well as from the dogs with naturally-occurring OA, and several additional potential biomarker candidates were recognized.

In vitro study assessed the panel's ability to distinguish between normal canine tissues and tissues cultured in mild, severe and super severe OA environments. Trends in total expression (in pg/ml) of each marker often correlated with the severity of disease. This novel biomarker panel shows promise for the diagnosis of early OA. It is currently being tested in the shoulder and elbow of dogs, and similar markers are under investigation in humans.