Winter Quarter 6:1;2012

e-news

Comparative Orthopaedic Lab

"Finding a joint solution"

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Current Projects

- Stemless Shoulder Arthroplasty
- Cervical Spine Fixation Testing
- Optimizing Allograft Tissue Preservation
- Biomarkers for Osteoarthritis
- Relationship of Vascular Disease with OA
- Pedicle Screw Fixation in Osteoporosis
- 3D Modeling of Pelvic Fractures
- Tissue Engineered Meniscus
- *In vitro* Model of Traumatic Arthritis
- On-field Diagnosis of Meniscal Pathology
- Distal Humerus Fixation Testing
- Biologic Total Joint Arthroplasty

Last quarter's "top 5"

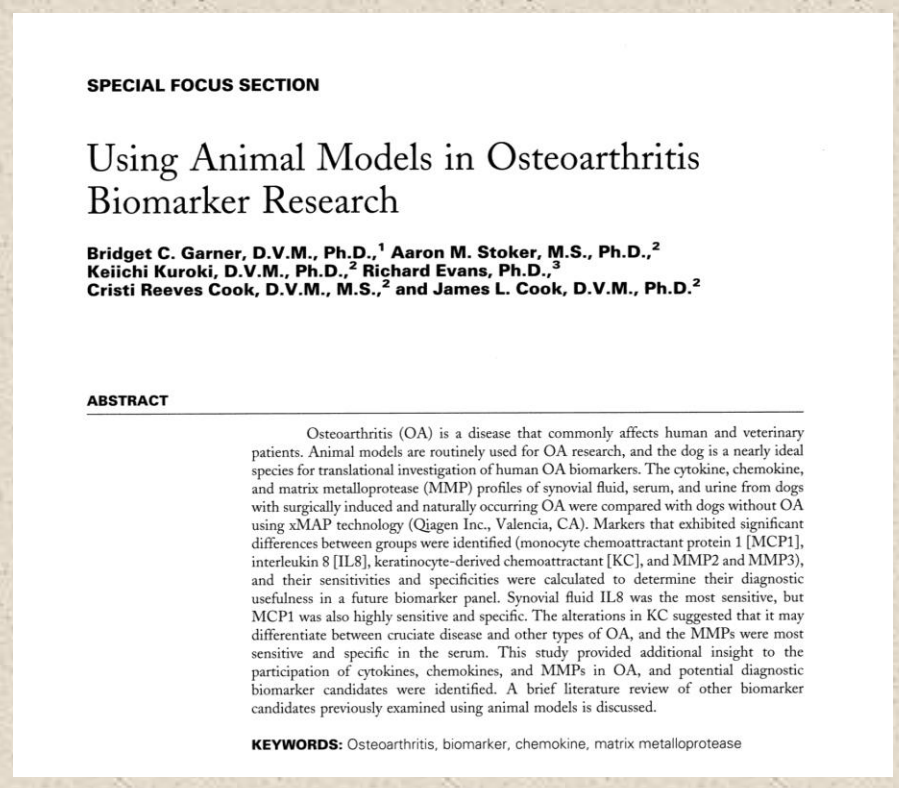
1. *Emma's Story* about work in the COL received a 2011 Telly Award
2. Three COL articles featured in special issue of *Clinical Orthopaedics & Related Research*
3. COL investigators received 6 new extramurally-funded research grants
4. First major publication of our OA biomarkers work in the *Journal of Knee Surgery*
5. Dr. Cook is guest editor with Dr. Clark Hung for *Clinical Relevant Strategies for Treating Cartilage and Meniscal Pathology* in CORR

Osteoarthritis Biomarkers work published in *The Journal of Knee Surgery*

Doctors Bridget Garner, Aaron Stoker, Kei Kuroki, Rich Evans, Cristi Cook and Jimi Cook published the first article on our novel and exciting biomarker panel for screening, early diagnosis, staging and treatment monitoring for osteoarthritis. This article was included in a Special Focus issue of *The Journal of Knee Surgery*.

It is exciting to see this work in print as we are hopeful that we will be able to fully validate our biomarker panel for clinical use in dogs and people so that more optimal preventative and therapeutic strategies and be effectively developed and tested.

We think this is a big step in our mission to better treat, and one day cure, arthritis in people and animals!



SPECIAL FOCUS SECTION

Using Animal Models in Osteoarthritis Biomarker Research

Bridget C. Garner, D.V.M., Ph.D.,[1] Aaron M. Stoker, M.S., Ph.D.,[2] Keiichi Kuroki, D.V.M., Ph.D.,[2] Richard Evans, Ph.D.,[3] Cristi Reeves Cook, D.V.M., M.S.,[2] and James L. Cook, D.V.M., Ph.D.[2]

ABSTRACT

Osteoarthritis (OA) is a disease that commonly affects human and veterinary patients. Animal models are routinely used for OA research, and the dog is a nearly ideal species for translational investigation of human OA biomarkers. The cytokine, chemokine, and matrix metalloprotease (MMP) profiles of synovial fluid, serum, and urine from dogs with surgically induced and naturally occurring OA were compared with dogs without OA using xMAP technology (Qiagen Inc., Valencia, CA). Markers that exhibited significant differences between groups were identified (monocyte chemoattractant protein 1 [MCP1], interleukin 8 [IL8], keratinocyte-derived chemoattractant [KC], and MMP2 and MMP3), and their sensitivities and specificities were calculated to determine their diagnostic usefulness in a future biomarker panel. Synovial fluid IL8 was the most sensitive, but MCP1 was also highly sensitive and specific. The alterations in KC suggested that it may differentiate between cruciate disease and other types of OA, and the MMPs were most sensitive and specific in the serum. This study provided additional insight to the participation of cytokines, chemokines, and MMPs in OA, and potential diagnostic biomarker candidates were identified. A brief literature review of other biomarker candidates previously examined using animal models is discussed.

KEYWORDS: Osteoarthritis, biomarker, chemokine, matrix metalloprotease

Recent Pubs

1. Garner BC, et al. Using animal models in osteoarthritis biomarker research. J Knee Surg 2011
2. Fox DB, et al. Cell-based meniscal engineering: A case for synoviocytes. Clin Orthop Rel Res 2011
3. Jayabalan P, et al. Bioactive glass as a subchondral substrate for tissue-engineered ostochondral constructs. Clin Orthop Rel Res 2011
4. Hung CT, Cook JL. Clinical relevant strategies for treating cartilage and meniscal pathology. Clin Orthop Rel Res 2011
5. Kuroki K, et al. Subchondral bone changes in three different canine models of osteoarthritis. OC & Cartilage 2011
6. Warnock JJ, Fox DB, et al. Evaluation of in vitro growth factor treatments on fibrochondrogenesis by synovial membrane cells. AJVR 2011
7. Franklin SF, Cook JL. What is the evidence? Total hip replacement vs femoral head and neck excision. JAVMA 2011
8. Fox DB, et al. Elbow pain in a young English Bulldog. NAVC Clin Brief 2011
9. Lee CH, Cook JL, et al. Regeneration of articular surface of a synovial joint by cell homing. The Lancet 2010