

Select Publications – Neil A. Duncan

- Duncan, N.A.**, Bruehlmann, S.B., Hunter, C.J., Shao, X., and Kelly, E.J. (2009) In situ cell-matrix mechanics in tendon fascicles and seeded collagen gels: implications for biomaterials design. (In submission: Journal of Biomechanics).
- Desrochers, J.E. and **Duncan, N.A.** (2009) Strain transfer in the annulus fibrosus under applied flexion. (In submission: Journal of Biomechanics).
- Shao, X. and **Duncan, N.A.** (2008) Cytoskeletal F-actin distribution and variation in human intervertebral disc. *14th Annual Canadian Connective Tissue Conference, June 5-7, Montreal.*
- McMillan, J. and **Duncan, N.A.** (2008) Intercellular communication in the human annulus fibrosus. *14th Annual Canadian Connective Tissue Conference, June 5-7, Montreal.*
- McMillan, J. and **Duncan, N.A.** (2008) Cell Communication in Scoliotic Human Annulus Fibrosus Tissue. *54th Annual Meeting of the Orthopaedic Research Society, Mar. 2-5, San Francisco.*
- Duncan, N.A.** and Desrochers, J.E. (2007) Surface and in situ strains in the posterior annulus fibrosus under applied flexion. *6th Combined Meeting of the Orthopaedic Research Society, Oct. 20-24, Honolulu.*
- McMillan, J. and **Duncan, N.A.** (2007) Cell morphology in the scoliotic human annulus fibrosus. *6th Combined Meeting of the Orthopaedic Research Society, Oct. 20-24, Honolulu.*
- Desrochers, J.E. and **Duncan, N.A.** (2007) The effect of applied load on calcium signaling in the bovine outer annulus. *53rd Annual Meeting of the Orthopaedic Research Society, Feb. 11-14, San Diego.*
- Villemure, I., Cloutier, L., Matyas, J.R. and **Duncan, N.A.** (2007) Non-uniform strain distribution within rat cartilaginous growth plate under uniaxial compression. *Journal of Biomechanics* 40:149-56.
- Duncan, N.A.** (2006) Cell deformation and micromechanical environment in the intervertebral disc. AAOS Workshop on Intervertebral Disc Degeneration, *Journal of Bone and Joint Surgery* 88 (Supplement 2): 47-51.
- Villemure, I., Cloutier, L., Matyas, J.R. and **Duncan, N.A.** (2007) Non-uniform strain distribution within rat cartilaginous growth plate under uniaxial compression. *Journal of Biomechanics* 40:149-56.
- Thomas, D.A., Matyas, J.R. and **Duncan, N.A.** (2006) Investigating the Role of Proteoglycans in Fibril Sliding: Altering the ECM of the Bovine Inner Annulus Fibrosus. *5th World Congress of Biomechanics, Jul. 29 – Aug. 4, Munich.*

- Kelly, E. J. and **Duncan, N. A.** (2006) Functional gap junctions in the annulus fibrosus. *52nd Annual Meeting of the Orthopaedic Research Society*, Mar. 19-22, Chicago.
- Villemure, I., Cloutier, L., Matyas, J.R. and **Duncan, N.A.** (2006) Non-uniform strain distribution within rat cartilaginous growth plate under uniaxial compression. *5th World Congress of Biomechanics*, Jul. 29 – Aug. 4, Munich.
- Villemure, I., Cloutier, L., Matyas, J.R. and **Duncan, N.A.** (2006) Strain patterns within rat cartilaginous growth plate under uniaxial compression differ among histomorphological zones. *5th World Congress of Biomechanics*, Jul. 29 – Aug. 4, Munich.
- Kelly, E. J. and **Duncan, N. A.** (2005) Intercellular communication via gap junctions in the annulus fibrosus. *European Cells and Materials (ECM VI) - Spinal Motion Segment: From Basic Science to Clinical Application*, Jul. 4-7, Davos, pg. 20.
- Bruehlmann, S.B., Kelly, E.J. and **Duncan, N. A.** (2005) In situ tendon damage occurs within the interfibril matrix. *51st Annual Meeting of the Orthopaedic Research Society*, Feb. 20-23, Washington D.C.
- Bruehlmann, S.B., Kelly, E.J. and **Duncan, N. A.** (2005) Preconditioning of tendon fascicles at the cellular level. *51st Annual Meeting of the Orthopaedic Research Society*, Feb. 20-23, Washington D.C.
- Wilson, J.R., **Duncan, N.A.** and Clark, R.B. (2005) Potassium swelling current effects volume regulation in canine articular chondrocytes. *Summer Bioengineering Meeting of the American Society of Mechanical Engineers*, Jun. 22-26, Vail.
- Powers, M.J. and **Duncan, N.A.** (2005) Investigation of specific energy and bone mineral density in drilling bone. *Summer Bioengineering Meeting of the American Society of Mechanical Engineers*, Jun. 22-26, Vail.
- Villemure, I., Chung, M.A., Kimm, M., Matyas, J.R. and **Duncan, N.A.** (2005) Static compressive loading reduces the mRNA expression of type II and X collagen in rat growth-plate chondrocytes during development. *Connective Tissue Research* 46: 211-219.
- Hunter, C.J., Matyas, J.R., **Duncan, N.A.** (2004) Cytomorphology of notochordal and chondrocytic cells from the nucleus pulposus: a species comparison. *Journal of Anatomy* 205: 357-362.
- Bruehlmann, S.B., Matyas, J.R. and **Duncan, N.A.** (2004) ISSLS Prize Winner: Collagen fibril sliding governs cell mechanics in the annulus fibrosus: an *in situ* confocal microscopy study of bovine discs. *Spine* 29: 2612-2620. (**ISSLS Prize Bioengineering – International Society for the Study of the Lumbar Spine**).

- Hunter, C.J., Matyas, J.R. and **Duncan, N.A.** (2004) Functional aspects of cellular structures in the notochordal nucleus pulposus: survival and cellular signaling in the canine intervertebral disc. *Spine* 29: 1099-1104.
- Wilson, J.R., **Duncan, N.A.**, Giles, W.R. and Clark, R.B. (2004) Characterization of a voltage-dependent K⁺ current in acutely-isolated canine articular chondrocytes. *Journal of Physiology* 557: 93-104.
- Bruehlmann, S.B., Hulme, P.A. and **Duncan, N.A.** (2004) In situ intercellular mechanics of the bovine outer annulus fibrosus subjected to biaxial strains. *Journal of Biomechanics* 37: 223-231.
- Hunter, C.J., Matyas, J.R. and **Duncan, N.A.** (2003) The notochordal cell in the nucleus pulposus: a review in the context of tissue engineering. *Tissue Engineering* 9: 667-677.
- Hunter, C.J., Matyas, J.R. and **Duncan, N.A.** (2003) The three-dimensional architecture of the notochordal nucleus pulposus: novel observations on cell structures in the canine intervertebral disc. *Journal of Anatomy* 202: 279-291.
- Miller-Young, J.E., **Duncan N.A.** and Baroud G. (2002) Material properties of the human calcaneal fat pad in compression: experiment and theory. *Journal of Biomechanics* 35:1523-31.
- Bruehlmann, S.B., Rattner, J.B., Matyas, J.R. and **Duncan, N.A.** (2002) Regional variations in the cellular matrix of the annulus fibrosus of the intervertebral disc. *Journal of Anatomy* 201: 159-171.
- Hulme, P., Bruehlmann, S.B. and **Duncan, N.A.** (2002) Apparatus to determine the macroscopic and microscopic biaxial swelling response of the annulus fibrosus. *Winter Annual Meeting of the American Society of Mechanical Engineers*, Nov. 17-22, New Orleans, IMECE2002-32506.
- Hulme, P., Chi, S., Young, D., Matyas, J.R., **Duncan, N.A.** (2002) Enzymatic digestion technique influences regulatory volume decrease of isolated bovine chondrocytes. *Winter Annual Meeting of the American Society of Mechanical Engineers*, Nov. 17-22, New Orleans, IMECE2002-32671.
- Dussault, C., Young, D. and **Duncan, N.A.** (2002) A new system for cyclical tensile loading of cultured connective tissue cells in a three-dimensional gel matrix. *Winter Annual Meeting of the American Society of Mechanical Engineers*, Nov. 17-22, New Orleans, IMECE2002-33601.
- Wilson, J.R. and **Duncan, N.A.** (2002) Modeling the ion channel behaviour of articular chondrocytes. *Winter Annual Meeting of the American Society of Mechanical Engineers*, Nov. 17-22, New Orleans, IMECE2002-32661.

- Villemure, I., Chung, M., Kimm, M., Matyas, J.R. and **Duncan, N.A.** (2002) The effects of mechanical loading on the mRNA expression of growth plate cells. *4th International Society of Spinal Deformities Meeting*, May 24-27, Athens, pp. 114-118.
- Fujita, Y., Wagner, D.R., Biviji, A.A., **Duncan, N.A.** and Lotz, J.C. (2000) Anisotropic shear behavior of the annulus fibrosus: effect of harvest site and tissue pre-strain. *Medical Engineering and Physics* 22: 349-357.
- Ahmed, A.M., and **Duncan, N.A.** (2000) Correlation of patellar tracking pattern with trochlear and retropatellar surface topographies. *Journal of Biomechanical Engineering* 122: 652-660.
- Ahmed, A.M., **Duncan, N.A.**, and Tanzer, M. (1999) In vitro measurement of the tracking pattern of the human patella. *Journal of Biomechanical Engineering* 121: 222-228.
- Lotz, J.C., Colliou, O.K., Chin, J.R., **Duncan, N.A.** and Liebenberg, E. (1998) Compression-induced degeneration of the intervertebral disc: an in vivo mouse model and finite element study. *Spine* 23: 2493-2506. (**Volvo Award Biomechanics – International Society for the Study of the Lumbar Spine**).
- Fujita, Y., **Duncan, N.A.**, and Lotz, J.C. (1997) The radial tensile properties of the lumbar annulus fibrosus are site and degeneration dependent. *Journal of Orthopaedic Research* 15: 814-819.
- Bass, E.C., **Duncan, N.A.**, Hariharan, J.S., Dusick, J., Bueff, H.U. and Lotz, J.C. (1997) The compressive creep behavior of the porcine intervertebral disc is affected by frozen storage. *Spine* 22: 2867-2876.
- Ahmed, A.M., Burke, D.L., **Duncan, N.A.**, and Chan, K.H. (1992) Ligament tension pattern in the flexed knee in combined passive anterior translation and axial rotation. *Journal of Orthopaedic Research* 10: 854-867.
- Duncan, N.A.**, and Ahmed, A.M. (1991) The role of axial rotation in the etiology of unilateral disc prolapse: An experimental and finite element study. *Spine* 16: 1089-1098.
- Ahmed, A.M., **Duncan, N.A.**, and Burke, D.L. (1990) The effect of facet geometry on the axial torque-rotation response of lumbar motion segments. *Spine* 15: 391-401.