

## Emeritus Professor Richard Aspden

DSc, PhD, BA, FIPEM, CSci

**Research specialisation:** Basic science of musculoskeletal health: how our bones and joints work and why we don't fall apart. Understanding osteoarthritis, osteoporosis and low back pain. Imaging biomarkers of musculoskeletal disease

**Experience:** Established the Orthopaedic Research Group in Aberdeen and jointly led the Musculoskeletal Research Programme for many years. Editorial consultant for the *Journal of Biomechanics*, European editor for *Journal of Back and Musculoskeletal Research*. Previously served on the committee and as Honorary Secretary for the Society for Back Pain Research, on research subcommittees for Arthritis Research UK and the Medical Research Council. Was awarded a Wellcome Travelling Fellowship and an MRC Senior Non-clinical Fellowship.



**Research overview:** Focus on understanding how tissues develop and maintain their mechanical properties, how they form joints to enable us to stand upright, the effects of ageing and what goes wrong when these systems fail. This involves working at all levels from the cells and the tissues they produce, to whole joints and whole people. Imaging plays a key role, especially statistical shape modelling as an imaging biomarker, and has led to numerous international collaborations. Modelling helps to understand the underlying mechanisms.

**Postgraduate supervision:** 20 PhD research students to completion. Recent topics have included the role of water in articular cartilage, the biomechanics of the spine during lifting manoeuvres, cannabinoid receptors in bone using mouse models.

**Research publications:** Over 150 peer reviewed publications, 2 edited books and 16 invited book chapters, 5 patents. Recent publications:

- H. Ahedi, R.M. Aspden, L. Blizzard, F. Saunders, F. Cicuttini, D. Aitken, G. Jones, J.S. Gregory. Hip shape associates with radiographic OA, leg strength, cartilage volume and predicts bone marrow lesions, effusion, pain and total hip replacement. *Arthritis Care and Research*, on line. DOI: 10.1002/acr.23166
- D.K. Temple, A.A. Cederlund, B.M. Lawless, R.M. Aspden and D.M. Espino Viscoelastic properties of human and bovine articular cartilage: a comparison of frequency-dependent trends. *BMC Musculosk Dis* 17: 419, 2016. DOI: 10.1186/s12891-016-1279-1
- A.B. Khalid, S.R. Goodyear, R.A. Ross and R.M. Aspden. Mechanical and material properties of cortical and trabecular bone from cannabinoid receptor-1-null (Cnr1<sup>-/-</sup>) mice. *Medl Eng Phys* 38 1044-1054, 2016. DOI: 10.1016/j.medengphy.2016.06.024
- S. Khan, D. Neilly, J. S. Gregory, R.M. Aspden, J.D. Hutchison, D.J. Deehan. Can radiographs of hip fractures predict subsequent hip fractures? A shape modeling analysis. *Injury* 47: 1543-1546, 2016. DOI: 10.1016/j.injury.2016.04.023
- J Nicod, RW Davies, N Cai, C Hassett, L Goodstadt, C Cosgrove, BK Yee, V Lionikaite, RE McIntyre, CA Remme, EM Lodder, JS Gregory, T Hough, R Joynson, H Phelps, B Nell, C Rowe, J Wood, A Walling, N Bopp, A Bhomra, P Hernandez-Pliego, J Callebert, RM Aspden, NP Talbot, PA Robbins, M Harrison, M Fray, J-M Launay, YM Pinto, DA Blizzard, CR Bezzina, DJ Adams, P Franken, T Weaver, S Wells, SDM Brown, PK Potter, P Klenerman, A Lionikas, R Mott and J Flint. Genome-wide association of multiple complex traits in outbred mice by ultra-low-coverage sequencing. *Nature Genetics* 48: 912-918, 2016. DOI:10.1038/ng.3595
- J.S. Gregory, R.J. Barr, V. Varela, T.S. Ahearn, J.H. Lee, F.J. Gilbert, T.W. Redpath, J.D. Hutchison, R.M. Aspden. Magnetic Resonance Imaging and the distribution of bone marrow fat in hip osteoarthritis. *Journal of Magnetic Resonance Imaging* 45: 42–50, 2017. DOI: 10.1002/jmri.25318
- A.E. Nelson, Y.M. Golightly, J.B. Renner, T.A. Schwartz, F. Liu, J.A. Lynch, J.S. Gregory, R.M Aspden, N.E. Lane and J.M. Jordan. Variations in hip shape are associated with radiographic knee osteoarthritis: cross-sectional and longitudinal analyses of the Johnston County Osteoarthritis Project. *Journal of Rheumatology* 43: 405-410, 2016 . DOI: 10.3899/jrheum.150559.



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