

15th December 2014

The High Bone Mass Study Newsletter

Hello, and welcome to the 5th edition of the annual High Bone Mass study update letter. We write this from our new research premises, still on the Southmead Hospital site, but in the brand new, purpose built Learning & Research Building.

There is plenty to report from what has been another very exciting and informative year of work by the study team. Analysis of data collected as part of the original study visits continues to generate interesting new findings, with 3 further scientific papers



being published this year and further work ongoing. Our study has been the first to measure the newly discovered bone-derived protein sclerostin in people with High Bone Mass. We found sclerostin levels to be elevated in High Bone Mass, likely reflecting the greater degree of bone mass. These novel findings help our

understanding of the potential role of this protein in bone metabolism. If you would like to receive a copy of this paper, please do let us know.

This year we have also learnt more regarding the relationship between High Bone Mass and osteoarthritis, from the work conducted by Dr Sarah Hardcastle during her PhD. Hip and knee X-rays taken in people with High Bone Mass have been compared with similar X-rays from two other large studies of people with normal bone density (the Chingford study (www.chingfordstudy.org.uk/) and the Hertfordshire cohort study (www.mrc.soton.ac.uk/herts)). Our results suggest that people with High Bone Mass may, in later life, be at increased risk of developing osteoarthritis in both their hip and knee joints. Interestingly, the X-ray changes seen at both joint sites in the High Bone Mass group followed a pattern favouring extra bone formation rather than cartilage breakdown. This work has now been published in two separate scientific papers; if you would like to receive copies then please do let us know.

We welcomed Aaron Murphy to our team this year, who as part of his Bachelor's degree in Health



Sciences, will be looking at hand X-rays to determine whether we see any changes of osteoarthritis in the hands of people with High Bone Mass. Aaron will be working with Dr Hardcastle and Dr Celia Gregson. The question he hopes to answer is whether the osteoarthritis X-ray changes we see in High Bone Mass (described above) occur only in weight bearing joints (*e.g.* knees and hips), or whether they are also seen in the non-weight bearing joints of the hand. Answering this question will help our understanding of the mechanisms which underlie osteoarthritis.

Our collaboration with our colleagues at the Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM, <http://www.ocdem.ox.ac.uk/>), enabled a small group of people with High



Bone Mass to attend a special clinic to have a series of tests looking at their metabolism (energy use). These tests included blood tests, breathing and heart rate tests and sampling of fat from under the skin. Analyses of these new data are complete and the scientific paper is just being finalised. The results help our

understanding of the relationships that exist between bone and energy metabolism.

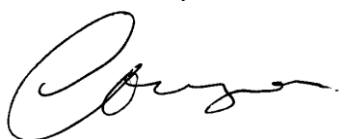
Work is still ongoing searching for changes in genes contributing to High Bone Mass. So far, a few families in our study have been found to have important single gene changes resulting in their high bone density; if this applies to you then we will have already contacted you to explain this. Further results indicate that people with High Bone Mass are more likely to have a number of small changes in a range of genes which are considered to be important in controlling bone density. The additive benefit of many small changes in genes may be to protect against osteoporosis, and instead increase bone density. This work has been presented by Dr Gregson at conferences in Prague and Sheffield earlier this year and it is hoped these findings will be published as scientific papers next year.

We hope you have enjoyed reading the latest news from the study, and once again we would like to express our sincere thanks to you all for your time and interest – without our study participants, this exciting work would simply not be possible. We also continue to be grateful for the generous financial support we receive from Arthritis Research UK and the National Institute for Health Research, as well as past funding from The Wellcome Trust.

If your contact details change, then please do remember to let us know. From all of the team, Season's Greetings and all the best for the New Year 2015.

With thanks and best wishes

Yours sincerely



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