Supplementary Information for:

Integrating GWAS and co-expression network data identifies causal BMD genes

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Running Title: Informing BMD GWAS using networks

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Table S1, related to Figure 1. List of 64 BMD GWAS SNPs used in the analysis from Estrada et al. 2012.

Table S2, related to Figure 1. The BMD GWAS Implicated Gene list (BGIG).

Table S3, related to Figure 1. List of significant gene ontology terms in the BGIG.

Table S4, related to STAR Methods. Primer and siRNA sequences

Primers or siRNAs	Sequence
Genotyping primer: Common-lox-P-F	GAGATGGCGCAACGCAATTAAT
Genotyping primer: Mark3-3'R	CTTTGCAGGACCCCAACAGG
Genotyping primer: Common-en2-3'R	CCAACTGACCTTGGGCAAGAACAT
Genotyping primer: Mark3-5' F	GCTTCCTGTGCACTGGGGTTA
Genotyping primer: Mark 3-172-5'	CACTCCTTTTGACGGAGAGAA
qPCR primers: Mark3-F	CCAAACAGTGACCTCAGCAA
qPCR primers: ; Mark3-R	TCCACACCAGATGCTGTGTTA
qPCR primers: 36B4-F	ACTGAGATTCGGGATATGCTGT
qPCR primers: 36B4-R	TCCTAGACCAGTGTTCTGAGCTG
siRNA: Mark3_1, MARK3MSS206517	sense-strand=GGAGGAUGAGCUUAAGCCAUUUGUU
siRNA: Mark3_2, MARK3MSS206518	sense-strand=GAGUCAGACCAGCACUGCAGAUAGU

Supplementary Figures

Figure S1, related to Figure 1. Modules 6 and 9 were not enriched for genes implcated by GWAS for a wide-range of phenotypes and diseases not directly related to bone.

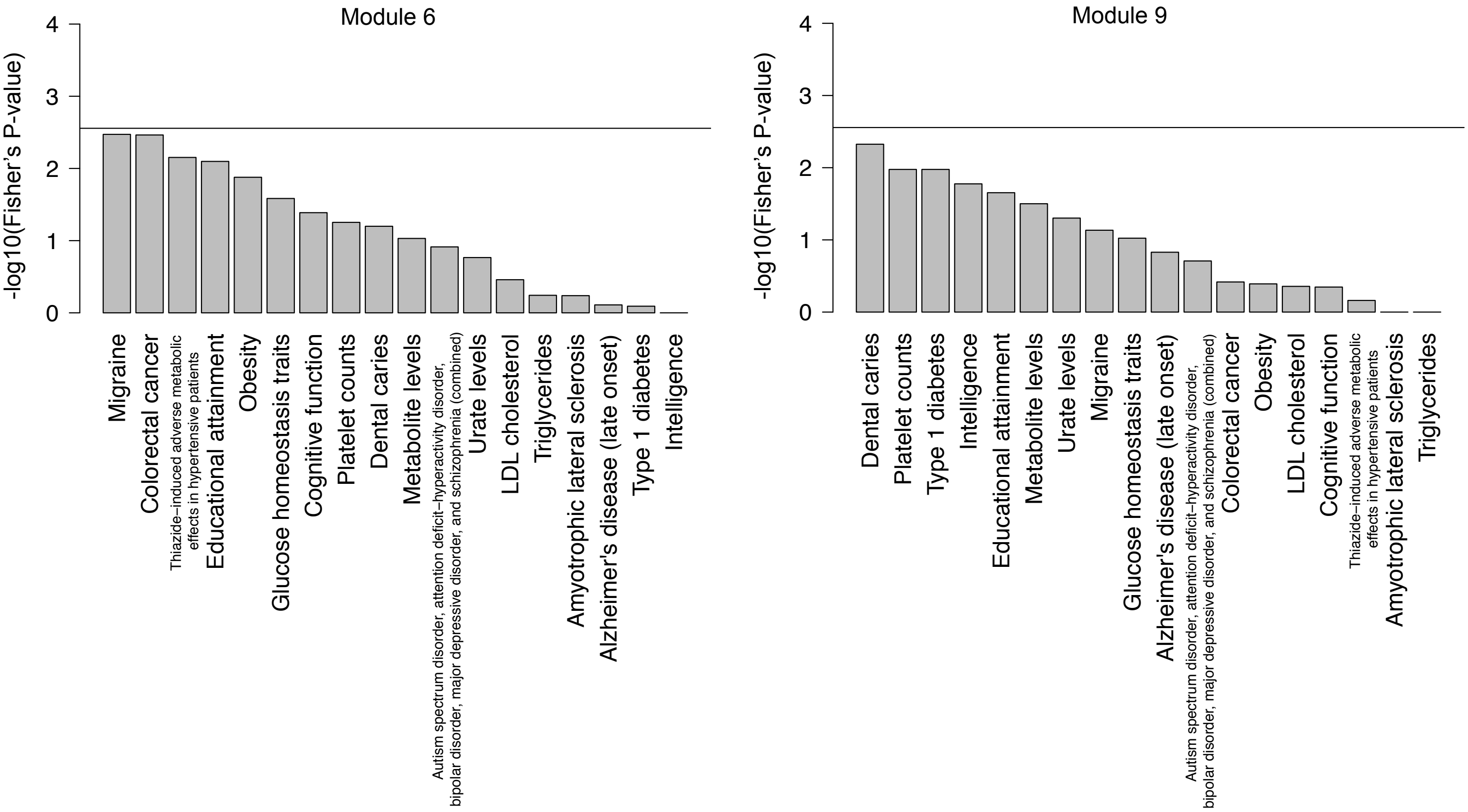

Figure S2, realted to Figure 1. The median correlation among OFM genes is higher than would be expected in random gene sets.

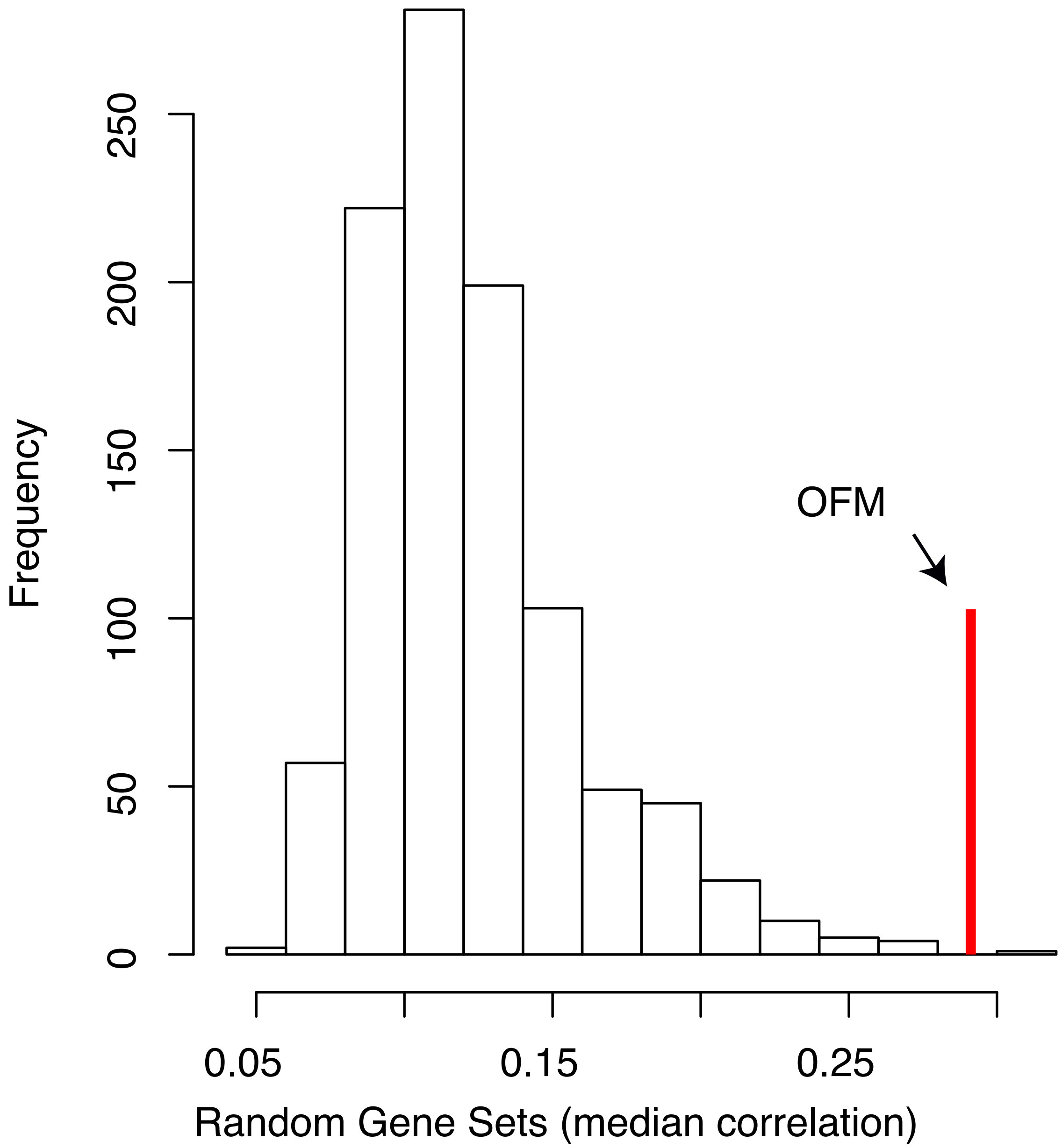

Figure S3, related to Figure 4. Expression profiles for *4930505A04Rik* and *Sptbn1*. A) Expression of *4930505A04Rik* across 96 different mouse tissues and cell-types /cell-lines. B) Expression of *4930505A04Rik* in purified osteoblasts across differentiation. B) Expression of *Sptbn1* across 96 different mouse tissues and cell-types /cell-lines. B) Expression of *Sptbn1* in purified osteoblasts across differentiation.Red boxes in A and C highlight gene expression in osteoblasts at day 5, 14 and 21 of osteogenic differentiation. Data images in A and C were downloaded from http://biogps.org. Data in B and D are from GSE54461.

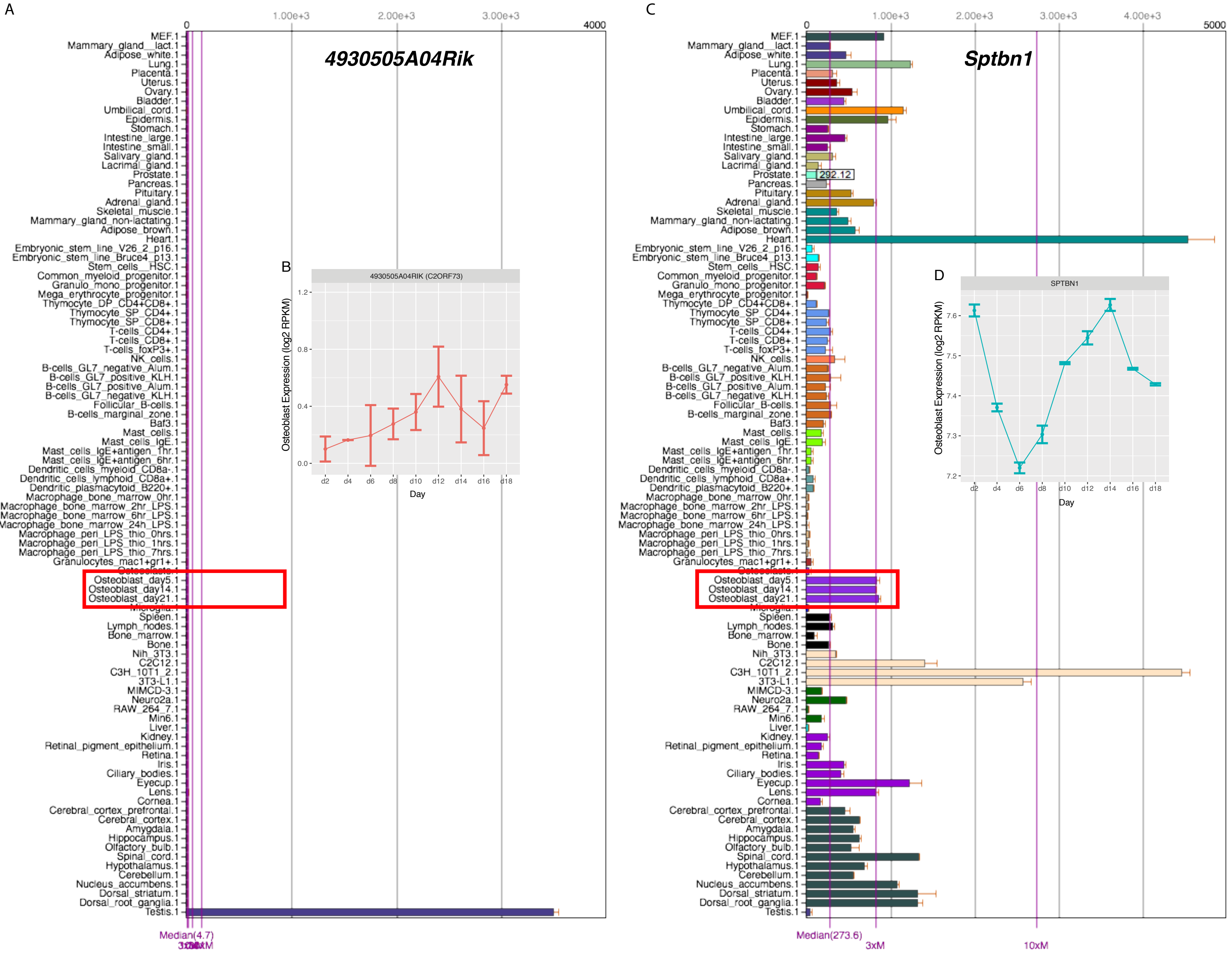

Figure S4, related to Figure 5. Expression profiles for *Mark3*. A) Expression of *Mark3* across 96 different mouse tissues and cell-types/cell-lines. Red box highlights gene expression in osteoblasts at day 5, 14 and 21 of osteogenic differentiation. Data were downloaded from http://biogps.org. B) Expression of *Mark3* in purified osteoblasts across differentiation. Data are from GSE54461. C) Mark3 immunofluorescence in 3T3 osteoblasts. First panel = DAPI nuclear staining, second panel = Mark3 staining, third panel = phalloidin staining for actin and fourth panel = merge. D) No staining with anti-MARK3 antibody can be seen in articular cartilage nor in growth plate chondrocytes (data not shown). In contrast, osteocytes in the bone at the cartilage-bone interface are well stained (see arrows). E) A seam of osteoid can be seen in contact with an island of bone marrow. Osteocytes are stained with anti-MARK3 antibody at the osteoid-bone interface as well as osteocytes deeper into the bone (see arrows). No staining with anti-MARK3 antibody above background can be visualized in any hematopoietic cells nor in bone marrow adipocytes (data not shown).