Figure S1. Representative images of differentiated and undifferentiated osteoblast from human MSCs. (A) Undifferentiated MSC with weak AP activity. (B) Differentiated osteoblast with high AP activity. (C) Undifferentiated MSC with weak extracellular calcium deposits. (D) Differentiated osteoblast with high extracellular calcium deposits, stained with Alizarin Red S. To detect differentiation into osteoblasts, human-mesenchymal stem cells (MSC) were cultured in MSC Osteogenic Differentiation medium, and as a negative control, it was cultured in MSC Growth Medium 2 on a chitosan nanofiber coated culture plate for 14 days and stained with BCIP/NBT to confirm AP activity, and stained with 1% Alizarin Red S to confirm extracellular calcium deposits. Scale bars, 200 μm. MSCs, mesenchymal stem cells; AP, alkaline phosphatase.

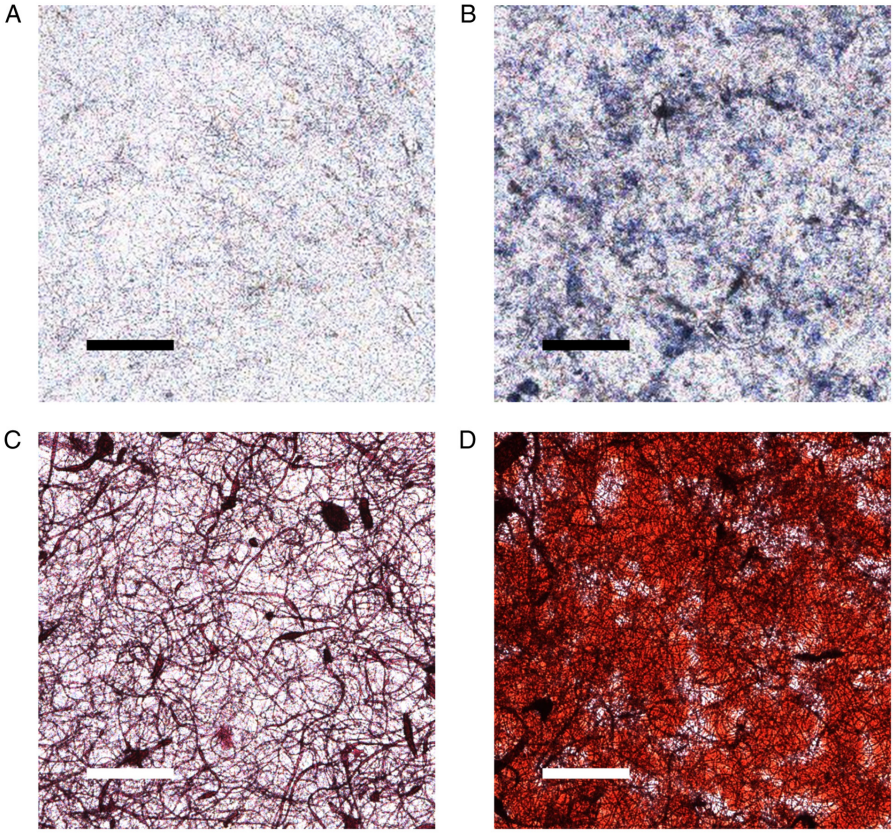

Figure S2. GFP-expressing C4-2 cells and RFP-expressing osteoblasts evaluated by flow cytometry. (A) GFP was successfully introduced into C4-2 cells. (B) RFP was successfully introduced into human mesenchymal stem cells. As a control, C4-2 cells and osteoblasts were used without transfection treatment. GFP, green fluorescent protein; RFP, red fluorescent protein.

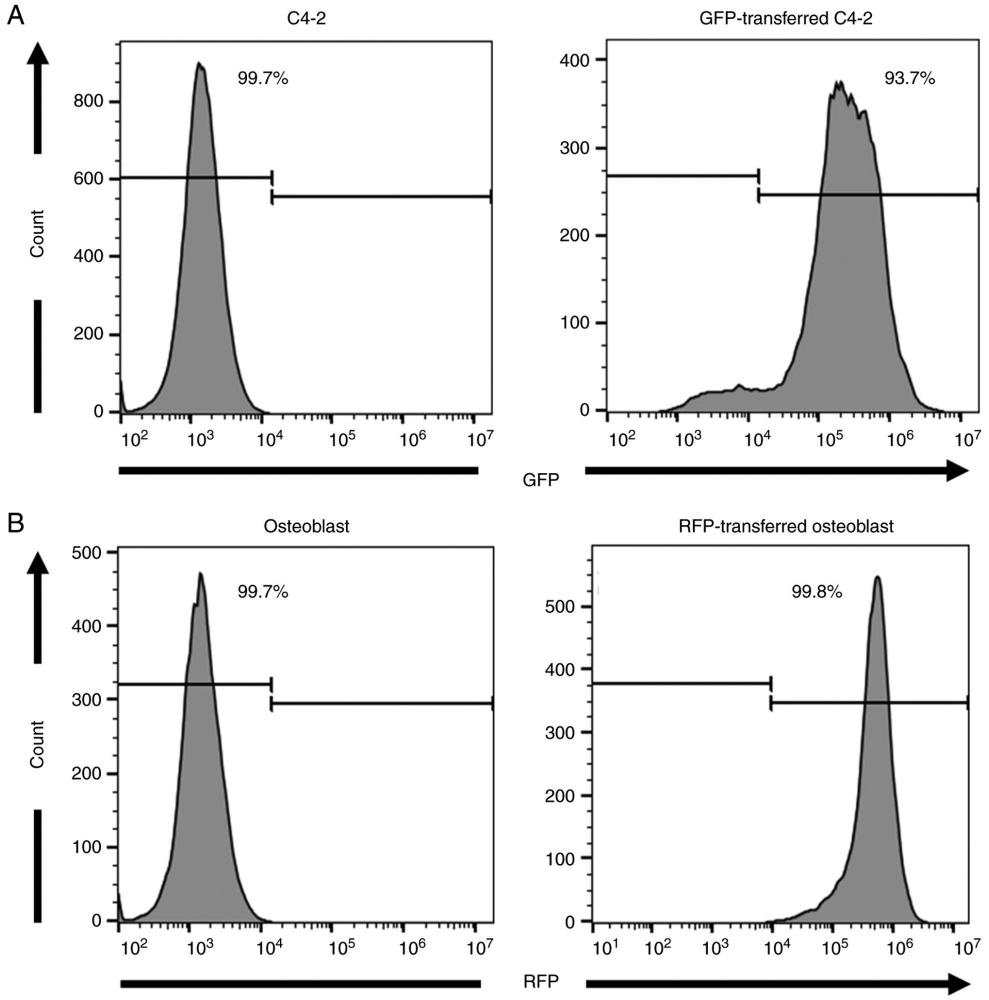

Figure S3. Growth comparison of C4-2 in monoculture and co-culture with human osteoblast in chitosan nanofiber coated 3D culture plate. (A) Co-culture with human osteoblast demonstrated significant growth enhancement effect of C4-2 (*P<0.01, day 52). (B) Comparison of image of C4-2 cells in from day 52. C4-2 cells proliferated in colonies with or without osteoblasts, and there was no obvious difference in morphology (green, proliferated C4-2 colonies; red, osteoblasts). Scale bars, 200 μm.

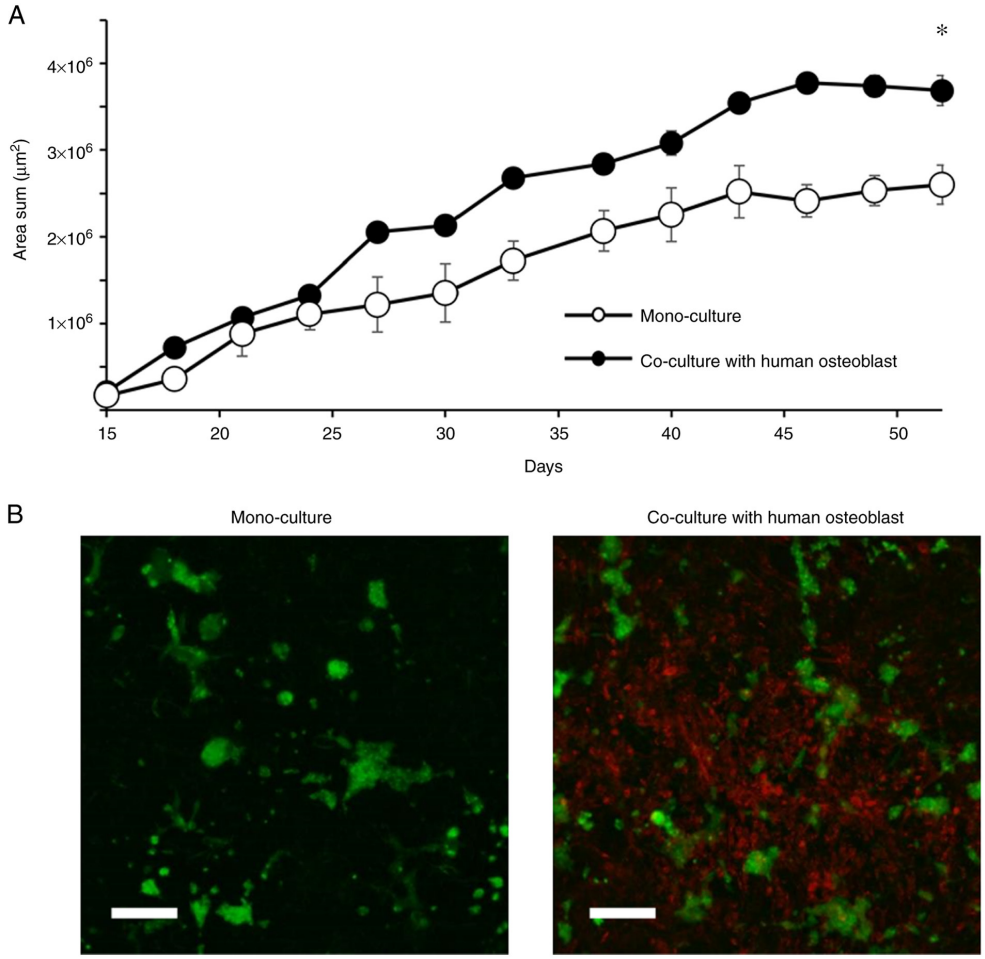

Figure S4. C4-2 and osteoblasts were isolated from co-cultured cell suspensions by and evaluated by flow cytometry. (A) All GFP-transferred C4-2 cells were labeled with APC-conjugated anti-PSMA antibodies. (B) Osteoblasts are not labeled with APC anti-PSMA antibodies. (C) GFP-transferred C4-2 and RFP-transferred osteoblasts were isolated from co-cultured cell suspensions by MACS using an anti-PSMA antibody. Almost all C4-2 cells could be harvested and labeled with the PSMA antibody. MACS, magnetic-activated cell sorting; APC, allophycocyanin; PSMA, prostate-specific membrane antigen; GFP, green fluorescent protein.

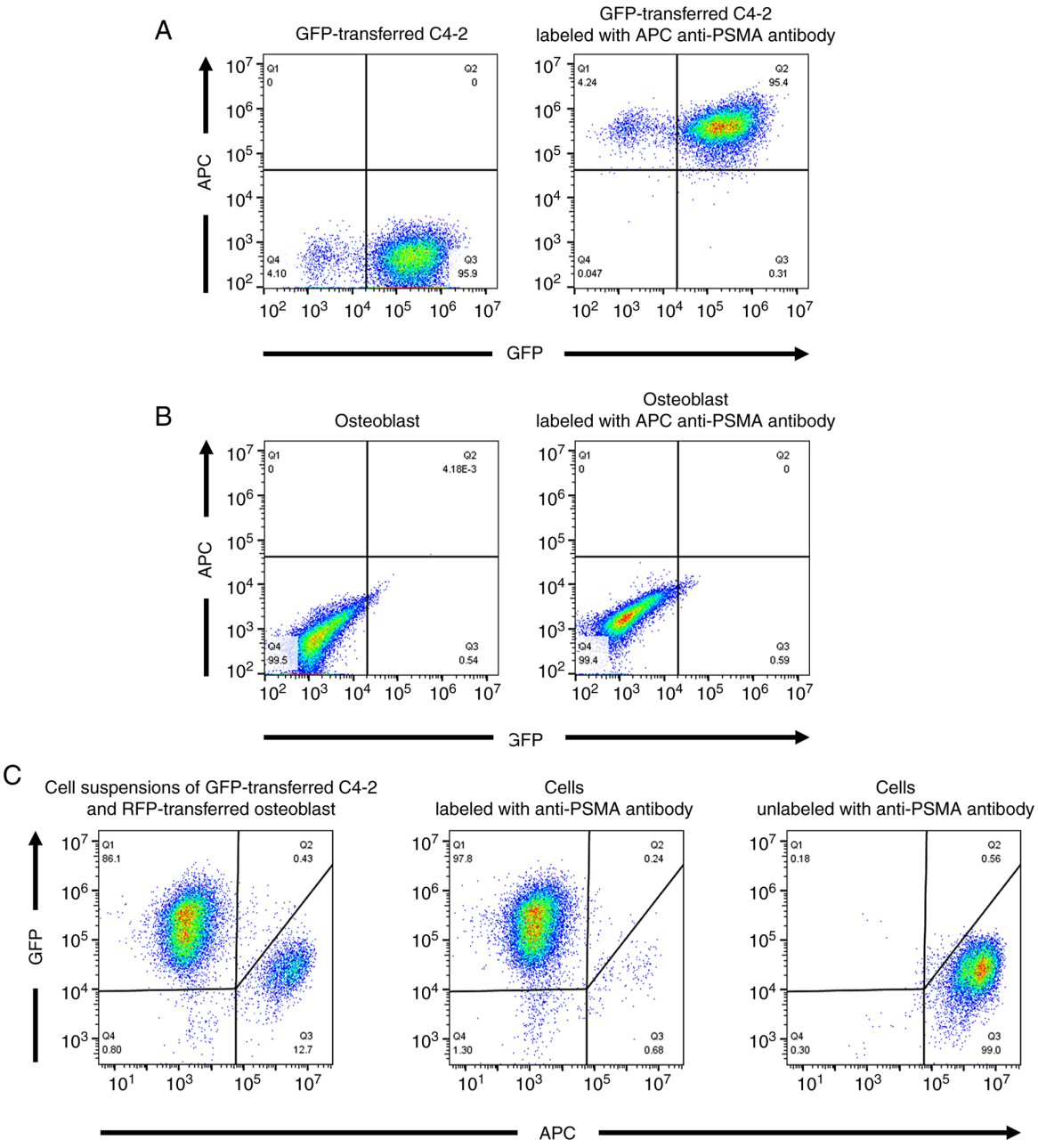

Figure S5. Analysis of osteoblast stimulatory factor expressions. mRNA expression levels of BMP2, VEGF-A and VEGF-B were significantly increased in co-culture compared with monoculture. **P<0.01. BMP2, bone morphogenetic protein 2; VEGF, vascular endothelial growth factor.

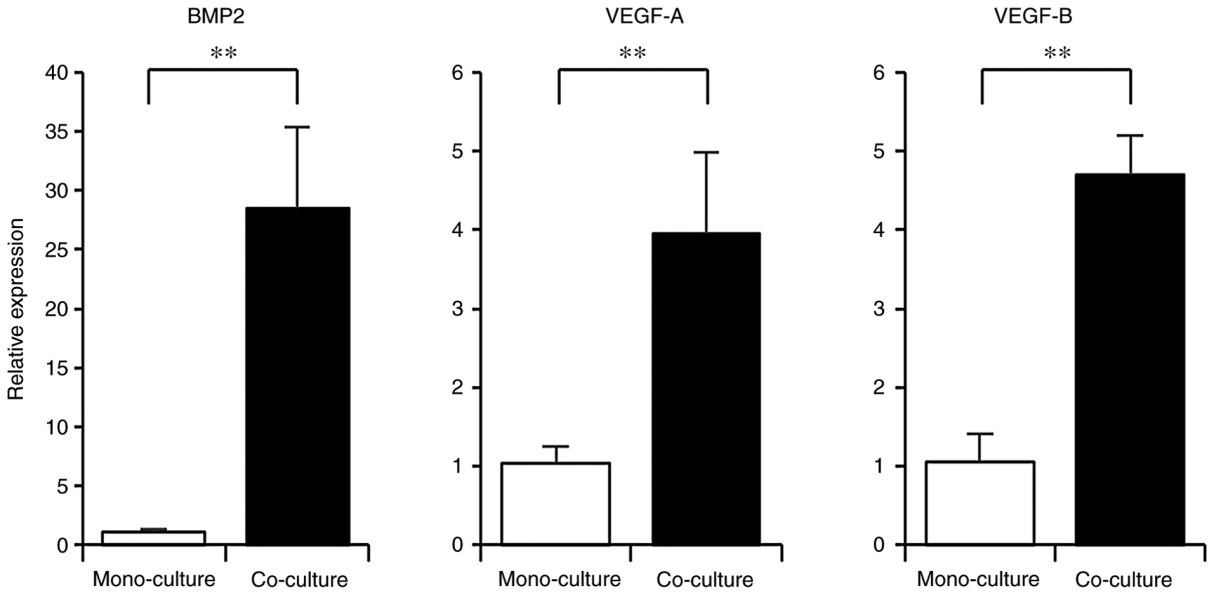

Figure S6. Longitudinal change of blood abiraterone and its metabolites in patients with castration-resistant prostate cancer treated with abiraterone and dutasteride combination therapy. PSA declines of the patient were 29.9% at abiraterone monotherapy, and 83.2% after abiraterone and dutasteride combination. The case was defined as an effective case. Number of abscissa axis; 1. 4 weeks after Abi monotherapy, 2-5. 2, 4, 8, and 12 weeks after Abi and Duta combination, respectively. PSA, prostate-specific antigen.