

# **The effect of Gu-Sui-Bu (*Drynaria fortunei* J Sm)**

## **Immobilized modified calcium hydrogenphosphate on bone cell activities**

許秀蘊

Sun JS;Dong GC;Lin CY;Sheu SY;Lin FH;Chen LT;Chang WH and Wang YJ

### **Abstract**

In our previous study, we have validated the efficacy and the safety of Gu-Sui-Bu [*Drynaria fortunei* (Kunze) J. Sm.] by the bone cells culture. However, a satisfactory delivery system for Gu-Sui-Bu must be developed before it can be used in clinical medicine. In this study, we try to use modified calcium hydrogenphosphate (MCHP) bioceramic as a carrier to transport Gu-Sui-Bu into the bone cell culture system. Toward this goal, we evaluated the effect of a Gu-Sui-Bu-immobilized modified calcium hydrogenphosphate (GI-MCHP) on the bone cells activities. THE CHINESE MEDICINE: Gu-Sui-Bu [*Drynaria fortunei* (kunze) J. Sm] was extracted and then immobilized on the surface of MCHP. The rat osteoblasts-osteoclasts co-culture system was used as the experimental model. After the cells grew to 80% confluence, different sizes of GI-MCHP particles were tested. The mitochondria activity of the bone cells after exposure was determined by colorimetric assay. Biochemical markers such as lactate dehydrogenase (LDH), alkaline phosphatase (ALP), acid phosphatase (ACP) and prostaglandin E(2) titer were analyzed to evaluate the bone cells activities. Histomorphometric study of osteoclasts activities and the phenotype expression of osteoblasts were also evaluated. There is no detectable titer of LDH secretion into the medium and no significant change in the intracellular ALP content. The ALP titer in the culture medium did increase significantly at 3 days' culture, while there is a significant decrease in the intracellular ACP content and significant increase in the ACP titer in the medium. The concentrations of PGE(2) in tested medium are always significantly higher than that of control medium during the 7 days' culture. At the end of 7 days' culture, the PGE(2) concentrations in the tested medium were still 4.74 times that of the control medium. After GI-MCHP treatment on bone cells, the size of the osteoclasts seems decreased and their cell integrity seems lost, while the osteoblasts phenotype expression was relatively preserved. From this study, we demonstrated that Gu-Sui-Bu [*Drynaria fortunei* (Kunze) J. Sm.] immobilized MCHP has well preserved the potential beneficial effects of Gu-Sui-Bu on the bone cells culture.