

Use of microarray technology to confirm biochemical mechanisms of bone health nutraceutical supplements

Yumei Lin

Nutriline Health Institute, USA

We used mechanism of action specific bioassays and neonatal murine calvariae culture systems to identify botanical ingredients that reduced bone resorption and stimulated bone growth. This approach resulted in development of 2 formulas: one to reduce bone resorption (AR, anti-resorptive) and the other one to stimulate bone growth (BF, bone formation). The objective of this research was to confirm the biochemical mechanisms using microarray technology in humans. In addition, general safety, tolerance and anabolic effects were monitored. The study was a 28-day randomized open-label study to examine the AR formula, BF formula and an AR+BF Combination formula. Forty-six healthy non-smoking postmenopausal women (postmenopausal age from 6 months to 5 years) were recruited. Efficacy was determined by comparing changes in gene expression profiling data between Day 1 and Day 28. Anabolic effect (Day 1 and Day 14 only), general safety and tolerance were also monitored during the course of the study. Cumulative results confirmed that the AR formula containing pomegranate and grape seed extracts demonstrated gene expression responses aligned with a reduction in bone resorption, and were linked to a down-regulation of RANKL, whereas the BF formula containing quercetin and ethanolic licorice extract demonstrated gene expression responses aligned with bone formation processes and up-regulation of BMP2 protein. We conclude that both the AR formula and the BF formula are effective, safe and well tolerated. The AR+BF Combination formula showed positive effects on bone health but nullified the effect found in the AR and BF formula.

Biography

Yumei Lin is a Sr. Scientist in the Supplement Product Development Department at Nutrilite Health Institute. Her research emphasizes the development of functional botanical products that have abilities to improve well-being and reduce disease prevalence. Her knowledge and expertise have contributed in developing many important NUTRILITE™ products. Dr. Lin also holds one patent and one patent pending. Dr. Lin was trained as nutritionist and received her Ph.D. in Nutrition from the University of California, Davis (UCD). After completing her degree, she held a faculty research position in the Nutrition Department at UCD. She also serves as an Executive Committee Member-At-Large for Southern California American Chemistry Association (SCALACS).

yumei.lin@amway.com