

**Joint Event**

11<sup>th</sup> International Conference on

**OSTEOPOROSIS, ARTHRITIS & MUSCULOSKELETAL DISORDERS**

**&**

**10<sup>th</sup> INTERNATIONAL CONFERENCE ON ARTHROPLASTY**

December 04-05, 2017 | Madrid, Spain



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**MMP inhibitors as novel therapeutics for osteoporosis**

We have developed novel non-antibiotic tetracycline (TC) formulations (Sub-antimicrobial Dose Doxycycline; SDD) and compounds (Chemically Modified Tetracyclines; CMTs) as matrix metalloproteinase inhibitors (MMPI). We and others demonstrated that they also inhibit osteoclast-mediated bone resorption associated with various conditions such as post-menopausal (PM) osteoporosis and diabetes-mediated osteoporosis in tissue culture, in animal models and in human clinical trials. In the ovariectomized rats, non-antimicrobial TCs were found to increase bone formation, as well as inhibit bone resorption, as mechanisms which “normalize” bone density. In a more recent NIH-supported study, we carried out a double-blind placebo-controlled clinical trial on 126 PM women exhibiting both periodontal (alveolar) bone loss and systemic bone loss (osteopenia). The 2-year regimen of SDD adjunctive to periodontal maintenance therapy not only significantly reduced: (1) the bone resorption marker, ICTP, and MMPs, in periodontal lesions, and (2) the progressive loss of alveolar bone; but also reduced the bone resorption markers, ICTP and CTX systemically in the serum samples from these patients. We propose that SDD reduces the risk of conversion of mild systemic bone loss (osteopenia) into the more severe form of bone deficiency disease, osteoporosis. Currently, we are developing new therapeutics derived from natural products (i.e., the chemically modified curcumins) as MMP-, and bone-resorption-inhibitors to treat chronic diseases such as osteoporosis and osteoarthritis.

**Biography**

Ying Gu has received her DDS and Ph.D degrees and resident studies from Stony Brook University School of Dental Medicine. She is currently an Associate Professor in the Department of General Dentistry, Stony Brook University. She has published book chapters and papers in reputed journals and serving as the reviewer of multiple journals.

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