

## Role of Cowpea Isoflavones and Vitamin D as Therapeutic Agents in the Osteoporosis Treatment using Human Osteoblasts as Model: Possible Involvement of OPG-RANKL Pathway

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Osteoporosis (OSP) a bone metabolic disorder apart from age and post menopause, arises mainly due to imbalance in the bone remodeling process. Bone remodeling is a recurring and uninterrupted biological process, which safeguards the preservation and renewal of the bone environment by two cells namely Osteoblasts and Osteoclasts. Osteoprotegerin (OPG), RANKL (Osteoprotegerin ligand) and RANK a tri-molecular structure also majorly helps in supporting the remodeling of the bone by maintaining proper balance. Plant based compounds specially isoflavones as the natural dietary source, are widely gaining importance in the treatment of major health indispositions like osteoporosis (OSP) due to their lesser side effects and remarkable health benefits. Hence in the present study, MG-63 cells, the widely studied human osteoblasts which resemble human fibroblasts, are experimented with isolated active constituents of cowpea i.e. daidzein and genistein [CP- (*Vigna Unguiculata*, Fabaceae family)] and vitamin D (VD) along with synthetic grade daidzein (Dz), genistein (Ge), as positive controls individually and in combinations and 17- $\beta$  estradiol (17- $\beta$ E) to determine the expression levels of proteins namely, OPG, RANKL and RANK, both at protein level, functional level and at mRNA level with or without inhibitor. The levels of the OPG and RANKL which were upregulated initially, did not show any changes in the expression levels after an estrogen antagonist ICC 182 780 exposure, at protein level but diminished expression was observed at m-RNA level. Thus, functional cowpea isoflavones could help in improving the OPG and RANKL expression thereby helping in proper bone remodeling.

### Biography:

Suresh Challa obtained his Master's Degree in Biochemistry from Sri Venkateswara University, Tirupati and received Gold Medal. He has obtained his Ph.D in Biochemistry from the same university. His research interests include Nutritional Biochemistry and Biochemical Toxicology both in vitro and in vivo models. He is presently serving as a Scientist F and Senior Deputy Director at National Institute of Nutrition and his research involves in addressing the pathologies associated with Osteoporosis and different therapeutic approaches in combating the disease and studying the intracellular effects of Cowpea isoflavones using both in vitro and in vivo models. He has been supervising students for Ph.D in several universities in the subjects of Biochemistry, Biotechnology and Nutrition. To his credit he has published more than 50 both national and international journals and participated in more than 25 national and international conferences and delivered research presentations. He is an active member of several professional bodies and societies.