**Dr. Mohan R. Wani**

**Statement of research achievements, if any, on which any award has already been received by the applicant. Please also upload brief citation(s) on the research work(s) for which the applicant has already received the award(s) (not to exceed 2000 words)**

**I have received following 3 awards for the research achievements given below**

* “**National Bioscience Award** for Career Development 2009” by DBT, Govt. of India, New Delhi.
* “**B. M. Birla Award 2004**” for outstanding research contributions in the field of Bone Remodeling and Medicine. This award was given by the B. M. Birla Science Centre, Hyderabad.
* **Prof. B. K. Bachhawat International Award** for Young Scientists for the year 2006 by Christian Medical College (CMC), Vellore, India.

**Area of specialization:** *Pathophysiology of**Bone and Cartilage Remodeling, Osteo-immunology, Stem Cell Biology and Regenerative Medicine.*

**IL-3 prevents pathological bone loss *and has important immunomodulatory role in regulation of rheumatoid arthritis***

Bone contains two distinct cell types, osteoblasts, essential for bone formation; and osteoclasts, essential for bone resorption (break-down). Co-ordinated activity of osteoblasts and osteoclasts is essential to maintain bone homeostasis and structural integrity of skeleton. Increased osteoclast activity and simultaneous decrease in osteoblast function result in pathological bone loss in musculoskeletal and autoimmune diseases. The present treatment prevents only the partial bone loss and does not induce new bone formation. We investigated the novel role of IL-3 in regulation of pathological bone loss and obtained following important research leads.

* We revealed that IL-3 acts directly on mouse osteoclast precursors, and inhibits receptor activator of NF-κB ligand (RANKL)-induced osteoclast differentiation and diverts the cells to macrophage lineage *(Khapli et al. 2003, The Journal of Immunology).*
* TNF-α is crucial to the pathogenesis of osteoporosis and RA. Further, we demonstrated that IL-3 inhibits TNF-α-induced osteoclast differentiation by inhibiting the expression of TNF receptors *(Yogesha et al., 2005, Journal of Biological Chemistry*).
* IL-3 also inhibits the TNF-α-induced bone resorption in presence of many pro-inflammatory cytokines such as IL-1α, TGF-β1, TGF-β3, IL-6 and PGE2. Interestingly, IL-3 prevents the development of inflammatory arthritis in mice, and protects cartilage and bone destruction *(Yogesha et al, 2009, The Journal of Immunology).* These novel findings are highlighted by ***Nature Reviews Rheumatology 2009.***
* This study was further extended to human osteoclast differentiation. Interestingly, IL-3 also inhibits human osteoclast differentiation and diverts the cells to dendritic cell lineage. Moreover, IL-3 inhibits bone resorption in osteoclast precursors of osteoporotic individuals *(Gupta et al., 2010 The Journal of Immunology)*.