**Department of Biotechnology**
**ALL INDIA INSTITUTE OF MEDICAL SCIENCES**
**Ansari Nagar, New Delhi-110 029, India**

***Dr. Rupesh K. Srivastava*** *PhD, MBA*
***Associate Professor***

***Tel:*** *011-26593548 (Direct)*
***E-mail:*** *rupeshk@aiims.edu*
*rupesh_srivastava13@yahoo.co.in*

**To Whomsoever It May Concern**

Dear **Organizers**,

This is to certify that the research work entitled ***"Bifidobacterium longum ameliorates ovariectomy-induced bone loss via enhancing anti-osteoclastogenic and immunomodulatory potential of regulatory B cells (Bregs)***" *published in* ***Frontiers in Immunology (2022****, 10.3389/fimmu.2022.875788)* submitted by **Miss Leena Sapra** for the *"Sun Pharma Science Foundation Science Scholar Awards under Bio-Medical Sciences category"* has been completely done by her as part of her PhD thesis work.

**Research Work Description:** This is the first study that reveals the osteoprotective and immunomodulatory potential of BL in an ovx mouse model via its ability to significantly enhance both the anti-osteoclastogenic and immunomodulatory potential of BL-induced Bregs. Our both in vitro and in vivo data strongly suggest that BL-induced Bregs exhibit significantly enhanced potential of suppressing osteoclastogenesis along with modulating Treg and Th17 differentiation in vitro. Of note, the immunomodulatory potential of BL is further strengthened from our serum cytokine data where we observe enhanced levels of anti-osteoclastogenic cytokines, i.e., IL-10 (signature cytokine of Breg and Tregs) and IFN-g together with reduced levels of osteoclastogenic cytokines, i.e., TNF-a, IL-6, and IL-17 (signature cytokine of Th17 cells). Altogether, the present study underlines the osteoprotective role of BL via modulating the immunoporotic "Breg–Treg–Th17 cell axis," thereby opening novel avenues for both the treatment and management of inflammatory bone loss observed in postmenopausal osteoporosis.

Please feel free to contact me if you have any questions at rupeshk@aiims.edu

Sincerely,

**Dr. Rupesh K. Srivastava**
Associate Professor
*Translational Immunology, Osteoimmunology & Immunoporosis Lab (TIOIL)*
Department of Biotechnology, AIIMS, New Delhi-110029